



Fisheries New Zealand

Tini a Tangaroa

Review of Amateur Fishing Charter Vessel reporting and characterisation

New Zealand Fisheries Assessment Report 2020/15

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EXECUTIVE SUMMARY

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This report describes methods that have been developed to electronically groom and summarise charter vessel catch and effort data, and the results of a survey of registered vessel operators.

Charter boat operators have been required to register and submit Amateur Fishing Charter Vessel - Activity Catch Returns (AFCV-ACR) since 1 October 2010, but the use of these data has been limited because they have only been available in a raw ungroomed state. Although fisheries managers have groomed data extracts before summarising the data, there has not been any formal retention of corrections made when errors have been identified. This manual grooming and regrooming of data is inefficient and may result in inconsistent interpretations of the fishery over time. Bespoke scripts have been developed as part of this project, to rapidly and consistently format and groom all available data in a single run. The correct identification of vessels, species, and fishing methods and formatting of dates, event locations, and other existing data fields has been significantly improved by the development of these *R* scripts, which have also been used to generate derived fields that fisheries managers will also find useful, such as the attribution of fishing events to: General Statistical Areas, Fisheries Management Areas (FMAs), Quota Management Areas (QMAs), and other areas of interest defined by fisheries managers. The benefits of this automated grooming approach will become increasingly apparent over time as data volumes steadily increase.

Scripts have also been written in *R* to generate standard outputs that fisheries managers can readily use to inform fisheries management, as described in this report. Possible uses for reported individual fish weight data are also explored and discussed here. These grooming and data characterisation scripts have been provided to Fisheries New Zealand for ready use and can be further developed if required.

A voluntary survey of registered amateur fishing charter boat operators was also undertaken to understand their interpretation of the AFCV-ACR return form and gauge their support for this reporting system and its implementation. Operators were also asked about the feasibility of electronic reporting and the compulsory recording of catches for additional species. Responses to each of the questions asked are summarised and some recommendations are given as a result.

1. INTRODUCTION

Over the past decade the Ministry for Primary Industries (MPI) has developed an integrated group of methods to estimate and monitor recreational catches. The components of this integrated system are: National Panel Surveys (Wynne-Jones et al. 2019); regional aerial-access surveys (Hartill et al. 2019); long-term digital camera/creel survey monitoring of effort and catch at high traffic access points (Hartill et al. 2015); and a compulsory Amateur Fishing Charter Vessel - Activity Catch Return (AFCV-ACR) reporting programme.

The least-developed and tested of these system components is the AFCV-ACR logbook programme, which has changed little since its introduction on 1 October 2010. The only formal evaluation of the AFCV-ACR logbook programme to date was undertaken as part of a general review of ancillary data sources on recreational harvests (Hartill 2015). This early review of logbook charter boat catch and effort data reported during the 2011–12 fishing year highlighted many data quality and formatting issues, which has resulted in the present study. Programme scripts have been developed, as part of this project, to electronically groom AFCV-ACR data so that standardised outputs can be rapidly generated in a consistent fashion, to inform fisheries management.

Registered charter boat operators were also surveyed: to understand how they interpreted the logbook reporting form; to gauge their willingness to report catches of other species; and to understand their views on submitting their reports electronically.

The overall objective of this study was to review information collected from Amateur Charter Vessels.

The specific objectives of this project were to first review information collected from Amateur Charter Vessels and then to recommend any changes to reporting or data management necessary to improve the utility of reporting by Amateur Charter Vessels.

2. ELECTRONIC GROOMING AND REVISION OF AFCR-ACR DATA TABLES

Charter boat skippers/operators are currently required to fill out paper AFCV-ACR logbook forms which are then sent to FishServe Innovations New Zealand (FINNZ), who enter the data into database tables maintained by Fisheries New Zealand. In contrast to most Fisheries New Zealand databases (see <https://www.mpi.govt.nz/news-and-resources/science-and-research/fisheries-research/fisheries-research-documentation-database?start=96>), there is currently no documentation for this database. A copy of the AFCV-ACR logbook form and the associated instructions given to charter boat operators can be found in Appendix 1. FINNZ also independently maintain a registry for amateur charter boat operators and process catch effort returns submitted by commercial fishers.

The data used for this review were initially provided by Fisheries New Zealand as a single Microsoft Excel spreadsheet, in which the data from three tables were linked into a hierarchical flat form spreadsheet. The three underlying tables were: a Return table (containing trip descriptor data recorded in sections 1, 2, and 5 of the form in Appendix 1); a Fishing Event table (recorded in section 3, for potentially multiple events during a trip); and a Catch table (recorded in section 4, for potentially multiple species caught during an event). The amalgamation of these three tables into a single flat file is cumbersome and inefficient, because all field entries from a parent field are repeated every time there is a matching entry in a child field (e.g., all data entered in the Return and Event tables is repeated for every catch record) and linking variable fields reappear in the spreadsheet as the data from each subsequent child table are added. Any analysis of the 34-field Excel flat file spreadsheet provided in this format will be more time consuming with each successive year, with almost 240 000 lines of data stored in this format after just eight years. The identification and enumeration of unique fishing trips and events is also problematic when data are provided in this format, given the repetitious nature.

A second extract of the original underlying data tables was therefore requested for this project. Scripts were written in *R* to groom the contents of each table. A single data format was enforced for each data field, such as decimalisation of reported latitudes and longitude and the transformation of all dates into a yyyy-mm-dd format. Lookup tables were used to enforce standard definitions for categorical variables such as species codes and fishing method codes. Unique and consistently defined vessel names, operator numbers, and Maritime Safety Authority (MSA) numbers were determined by cross referencing them against a vessel registry, with some further hard-wiring to overcome obvious misspelling of names and mis-punching of vessel numbers. A point-to-polygon function was used to assign fishing events with recorded latitude and longitude positions to Statistical Areas, Fisheries Management Areas (FMAs), Quota Management Areas (QMAs, given the recorded species code and the FMA within which a fishing trip occurred), and other smaller areas defined by fisheries managers. The registered base port for a vessel was used to assign its activity to FMAs and QMAs when fishing positions were not recorded. Upper range limits were set for some numerical fields, such as fishing duration and number of fishers per trip, and for the maximum number of fish retained per trip based on the number of fishers participating in a fishing event and the daily bag limit mandated for a QMA at the time of the trip. Each fishing event was assigned to a month, calendar year, October fishing year (1 October to 30 September), and April fishing year (1 April to 31 March), from its groomed event date. Specific descriptions for each field and the methods used to groom their contents or derive a field from another field are given in Appendix 2.

The field content of the groomed Return, Fishing Event, and Catch tables was used to produce revised data tables that can be readily summarised in Excel when filters and pivot tables are used. Hierarchical links between tables have been used to reproduce some of the data held in a higher-level parent table in a lower-level child table, so that each table can be interpreted on its own in a less ambiguous and more informative manner, as indicated in Figure 1.

This revised three table data format is therefore a compromise between the efficiency provided by a relational database structure, and a simpler single flat file multi-table spreadsheet with ambiguous and repeated links for each fishing event and catch record. The *R* grooming script provided to Fisheries New Zealand can be used to rapidly and consistently update each output table from the raw ACFV-ACR data tables maintained by FINNZ on Fisheries New Zealand's behalf.

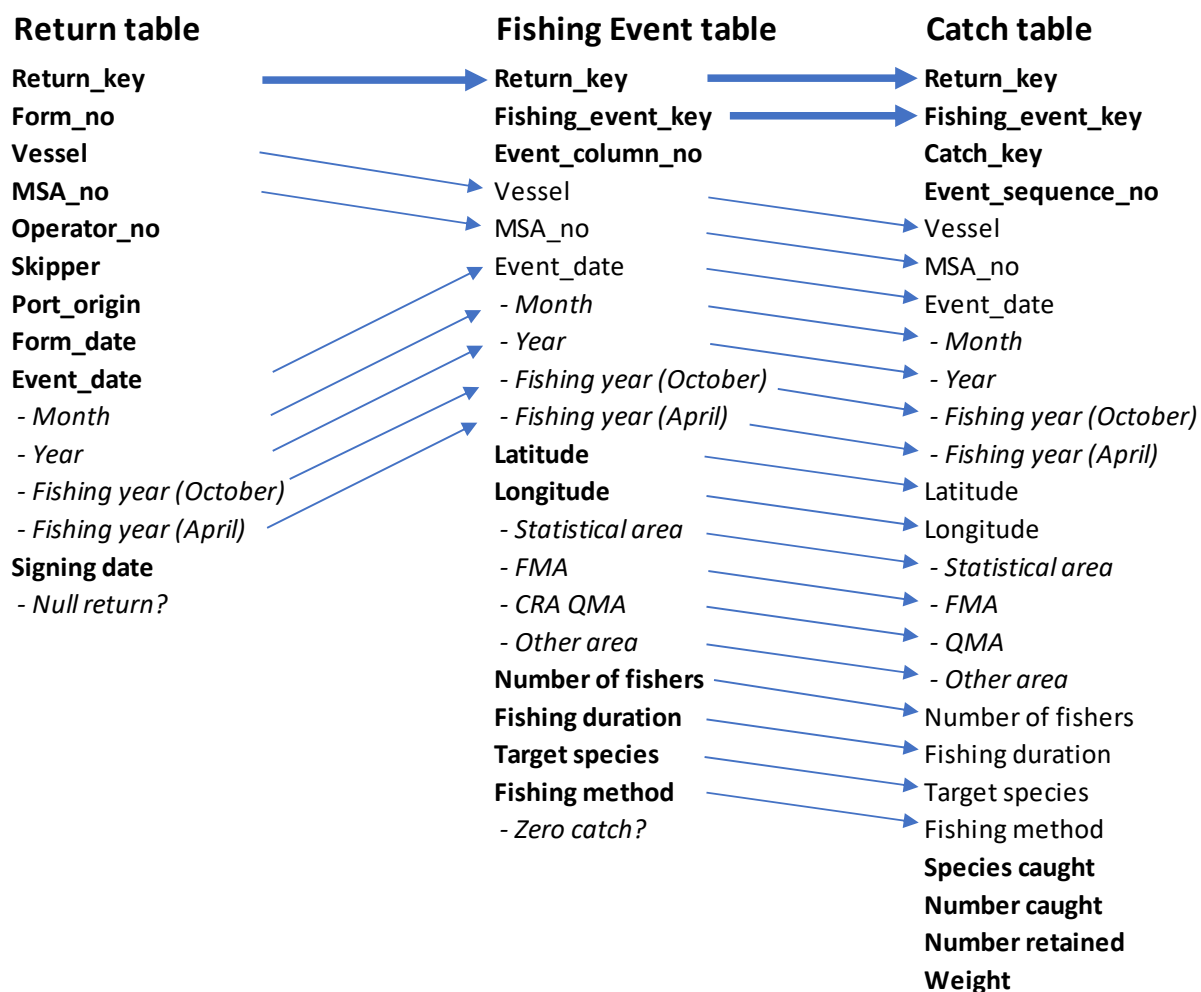


Figure 1: Revised structure and content of groomed AFCV-ACR data tables. Field names in bold indicate fields in the original data table, that have been groomed in most cases. Field names in italics indicate fields that have been derived from existing data. Bold arrows denote the links between an upper-level parent table and a lower-level child table, with other arrows denoting table content repeated from an upper level table.

3. SUMMARY AND CHARACTERISATION OF GROOMED AFCV-ACR DATA

Although the tables described above can be used to easily and consistently interpret and summarise logbook data provided by charter boat skippers, interviews with fisheries managers were also used to identify standard outputs that are frequently required. R scripts have been written to generate these outputs, to produce up-to-date characterisations at short notice in a consistent fashion.

Examples of most of these outputs are shown in the following sections of this report, but some are not included because they contain commercially sensitive information which is not available to the public, such as the number of fishing events reported by individual charter boats during a calendar or fishing year, or the actual location of fishing events. The information presented here is based on data available up until the end of May 2019, and therefore provides only a partial description of charter boat effort and catch for the 2018–19 fishing year.

3.1 Number of boats reporting activity in each FMA in each October fishing year

Since the inception of the AFCV-ACR reporting system at the beginning of the 2010–11 year, there has only been a small reduction in the number of vessels reporting fishing activity and submitting logbook

records generally, i.e., including vessels that only submit null fishing returns during the year (Table 1). Some vessels have reported fishing activity in more than one FMA during a year. It is important to note, however, that trips undertaken by vessels that did not report latitudes and longitudes for fishing events were assigned to a FMA based on the vessel's registered base port. This will probably lead to an underestimate of the number of boats fishing in neighbouring FMAs if a vessel travels some distance to fish elsewhere and does not report its fishing position with reasonable accuracy.

Table 1: Number of amateur charter vessels reporting fishing activity in each FMA by October fishing year, with annual totals of the number of vessels fishing across all FMAs and the number of vessels that submitted AFCV-ACRs returns including null fishing returns.

Fishing year	FMA 1	FMA 2	FMA 3	FMA 4	FMA 5	FMA 7	FMA 8	FMA 9	Total fishing	Total reporting
2010–11	152	34	33	4	25	52	20	67	268	302
2011–12	152	35	34	5	26	49	22	55	265	304
2012–13	162	28	41	8	27	44	16	50	267	309
2013–14	155	34	37	9	26	38	19	63	274	316
2014–15	144	28	32	5	23	36	20	45	251	301
2015–16	147	25	27	3	26	29	15	62	242	286
2016–17	144	24	26	4	31	31	15	49	248	279
2017–18	152	31	32	3	29	27	20	52	254	291
2018–19	113	18	25	2	25	20	16	35	202	261

3.2 Number of fisher events in each QMA in each October fishing year

Although the number of vessels reporting fishing activity annually has decreased over time (Table 1), there has been a gradual increase in the number of fisher events reported annually by these vessels from 2010–11 to 2017–18. This increase in fisher events has occurred mostly in FMAs 1 and 5, whereas the number of events has declined in FMAs 2 and 7. It is important to note, however, that multiple events are reported for some trips and, in most but not all cases, a fisher will participate in more than one of these events. There is no way of discerning how many fishers were onboard during a trip when multiple fishing events were reported for that trip, but the maximum number of fishers reported across all events during a trip is probably a reasonable indication.

Table 2: Reported number of fishers participating in the first event reported by a charter boat for each reported trip, in each FMA by October fishing year.

Fishing year	FMA 1	FMA 2	FMA 3	FMA 4	FMA 5	FMA 7	FMA 8	FMA 9	Total
2010–11	59 653	4 341	8 106	161	8 889	6 433	2 147	10 587	100 328
2011–12	64 632	6 822	12 061	302	9 874	6 711	1 860	13 780	116 048
2012–13	64 576	7 855	15 627	248	9 656	6 508	1 629	11 942	118 046
2013–14	68 151	9 098	13 748	368	10 470	6 407	1 503	13 072	122 817
2014–15	68 991	6 883	16 911	120	9 348	6 145	1 522	13 701	123 621
2015–16	67 873	5 107	21 454	39	11 187	4 791	1 526	15 298	127 275
2016–17	73 742	4 777	15 310	283	13 472	4 121	1 072	11 690	124 467
2017–18	76 624	4 554	20 179	317	13 890	4 868	1 957	14 376	136 765
2018–19*	29 641	1 344	7 290	78	3 886	1 440	959	6 139	50 978

* Totals for the 2018–19 fishing year are incomplete because they are based on data reported up until the end of May 2019.

3.3 Reported catch numbers by species by QMA and fishing year

Summary tables of the number of fish caught and the number retained have been generated for those species where compulsory reporting is required: blue cod (BCO - *Parapercis colias*); hapuku/bass (HPB - *Polyprion oxygeneios* & *P. americanus*); bluenose (BNS - *Hyperoglyphe antarctica*); rock lobster (CRA - *Jasus edwardsii*); kingfish (KIN - *Seriola lalandi*); southern bluefin tuna (STN - *Thunnus maccoyii*); and Pacific bluefin tuna (TOR - *Thunnus orientalis*). The annual catch totals reported by the charter fleet for compulsory reporting species have fluctuated over time, with no apparent trend in most cases (Figures 2–8).

The catch summaries given for the HPB stocks (Figure 3) are combined totals for catches recorded against the HAP (hapuku), BAS (bass), and generic HPB species codes. Bass is generally a smaller component of HPB catch and is caught mainly in the northern FMAs 1 & 9 (HPB 1). Hapuku and bass are caught in many of the Statistical Areas in HPB 1. Most of the HPB 2 catch comes from East Cape and Ranfurly Bank (Statistical Area 011 – 56%) and eastern Cook Strait (Statistical Area 016 – 28%). In HPB 7, most of the HPB catch is taken from the western Cook Strait (Statistical Area 017 – 62%). The main areas in HPB 3 where catches of hapuku/bass are reported are off Kaikoura (Statistical Area 018 – 33%) and Otago (Statistical Area 024 – 44%). Catches taken from Fiordland (Statistical Area 031) account for 90% of the hapuku/bass catch taken from HPB 5.

Most of the reported bluenose catch taken from BNS 1 was caught in the Bay of Plenty, with 80% taken from Statistical Areas 009 and 010. Bluenose catches from Cook Strait (Statistical Area 016) account for 73% of the reported BNS 2 catch. Only a small number of bluenose catches were reported for the South Island fisheries, with most taken from Statistical Area 031, off Fiordland.

The QMAs for rock lobster do not conform to boundaries between FMAs (Appendix 3). In CRA 2 most reported catches of rock lobster were taken off the north eastern Coromandel in Statistical Area 008 (66%). In CRA 3 and CRA 4 most of the reported catch was taken from areas close to Gisborne and Wellington. Over 95% of rock lobster catch reported for CRA 5 was from vessels departing from Kaikoura to fish in Statistical Area 018. In CRA 8, over 90% of rock lobster catch came from Fiordland waters in Statistical Area 031.

Annual totals of the number of fish caught and number of fish retained annually from each QMA can be used to determine the proportion of the catch that is not released when caught (Tables 3–9). Retention rates are mostly high for most of the compulsory reporting species and associated fish stocks. Retention rates are more variable for the rock lobster stocks (Table 6) and are particularly low in CRA 5, where only 20 to 30% of the reported catch has been retained in recent years. Higher rock lobster release rates are likely to occur in the south, where most of the catch is taken by potting. A greater proportion of the rock lobster catch in northern New Zealand is taken by scuba divers, who are less likely to bring under-sized rock lobster back to a charter boat.

Blue cod

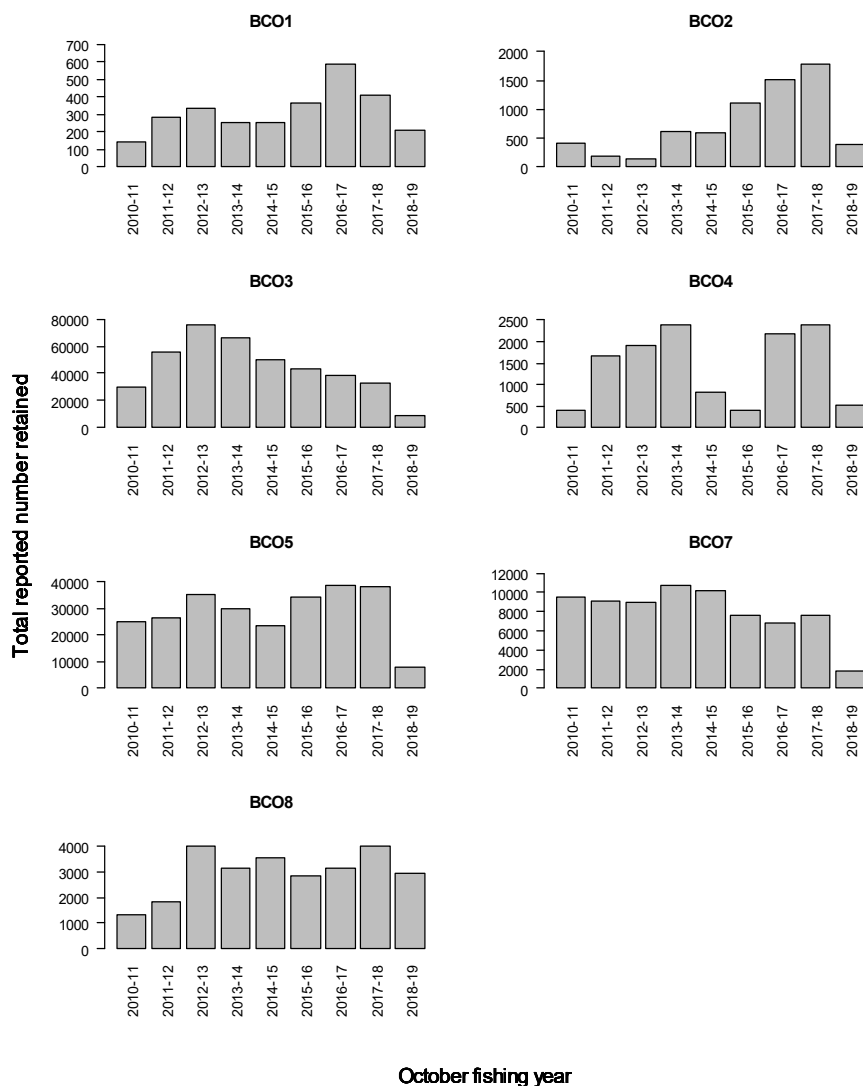
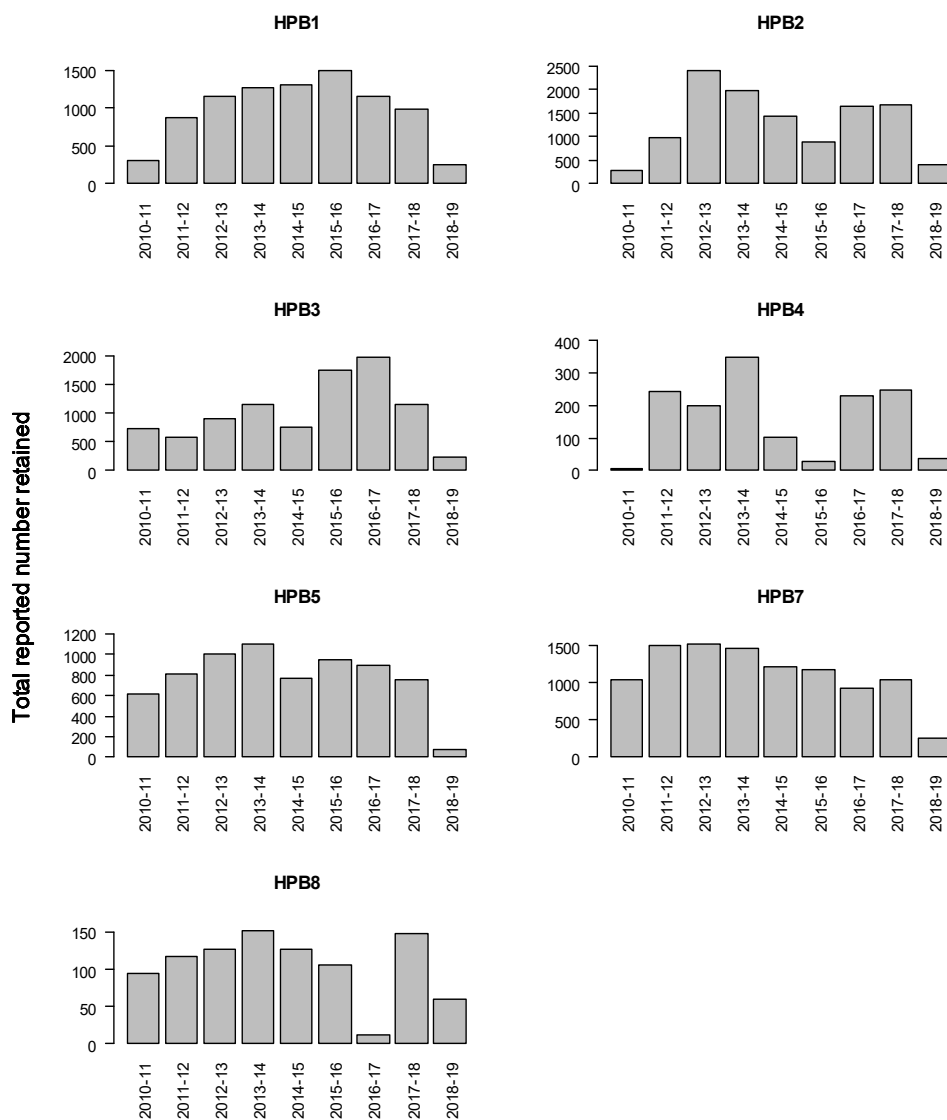


Figure 2: Total reported number of blue cod retained by Quota Management Area by October fishing year. Charter boat reporting for the BCO 1 stock is not compulsory, so the catch statistics for this stock are probably under-estimates. Data for the 2018–19 October fishing year are incomplete.

Table 3: Proportion of the reported blue cod catch that is retained, based on summary tables of the number of fish caught and the number retained, by QMA by October fishing year. Data for 2018–19 are incomplete.

QMA	2010–11	2011–12	2012–13	2013–14	2014–15	2015–16	2016–17	2017–18	2018–19
BCO 1	0.34	0.58	0.51	0.57	0.61	0.56	0.60	0.61	0.48
BCO 2	0.48	0.42	0.52	0.67	0.70	0.93	0.74	0.71	0.71
BCO 3	0.76	0.72	0.74	0.77	0.76	0.79	0.82	0.78	0.76
BCO 4	0.78	0.82	0.80	0.77	0.70	0.82	0.70	0.74	0.74
BCO 5	0.62	0.57	0.59	0.61	0.55	0.64	0.58	0.57	0.50
BCO 7	0.33	0.30	0.29	0.32	0.32	0.35	0.38	0.37	0.35
BCO 8	0.51	0.50	0.54	0.57	0.59	0.59	0.61	0.62	0.69

Hapuku/bass



October fishing year

Figure 3: Total reported number of hapuku/bass retained by Quota Management Area by October fishing year. Data for the 2018–19 October fishing year are incomplete.

Table 4: Proportion of the reported hapuku/bass catch that is retained, based on summary tables of the number of fish caught and the number retained, by QMA by October fishing year. Data for 2018–19 are incomplete.

QMA	2010–11	2011–12	2012–13	2013–14	2014–15	2015–16	2016–17	2017–18	2018–19
HPB 1	0.86	0.91	0.97	0.94	0.96	0.97	0.88	0.99	1.00
HPB 2	0.92	0.92	0.95	0.95	1.00	0.98	1.00	1.00	1.00
HPB 3	0.96	0.99	0.99	0.99	1.00	0.99	0.99	0.99	0.99
HPB 4	1.00	0.73	0.62	0.68	0.89	0.57	0.98	1.00	1.00
HPB 5	0.99	0.96	1.01	0.92	0.94	0.97	0.97	0.98	1.00
HPB7	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	1.00
HPB 8	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.75

Bluenose

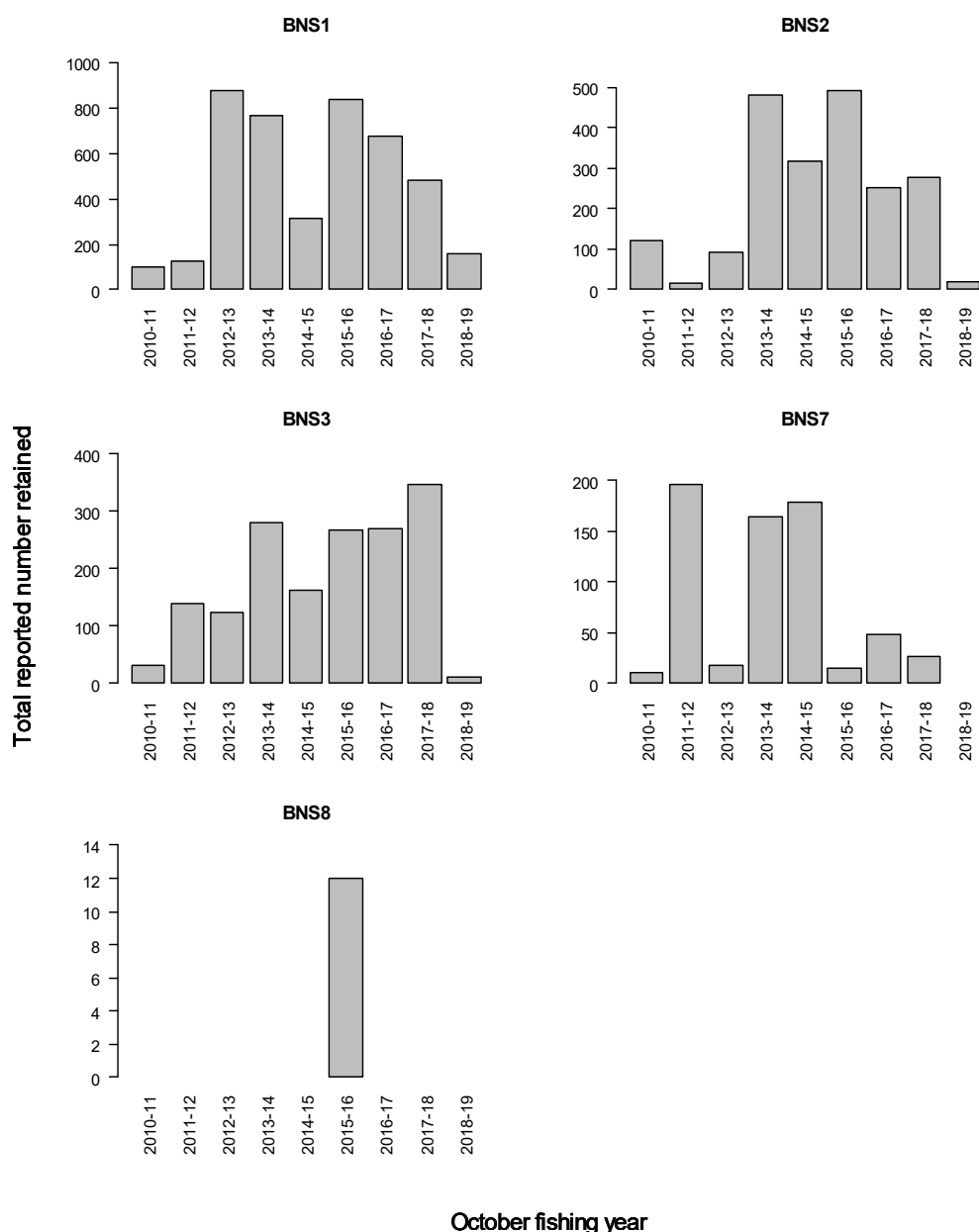


Figure 4: Total reported number of bluenose retained by Quota Management Area by October fishing year. Data for the 2018–19 October fishing year are incomplete.

Table 5: Proportion of the reported bluenose catch that is retained, based on summary tables of the number of fish caught and the number retained, by QMA by October fishing year. Data for 2018–19 are incomplete.

QMA	2010–11	2011–12	2012–13	2013–14	2014–15	2015–16	2016–17	2017–18	2018–19
BNS 1	0.98	1.00	1.00	0.99	0.95	0.98	0.98	1.00	0.99
BNS 2	1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00	1.00
BNS3	1.00	1.00	0.92	0.99	1.00	0.99	0.94	1.00	0.92
BNS 7	0.85	1.00	1.00	0.98	0.95	1.00	0.86	1.00	–
BNS 8	–	–	–	–	–	1.00	–	–	–

Rock lobster

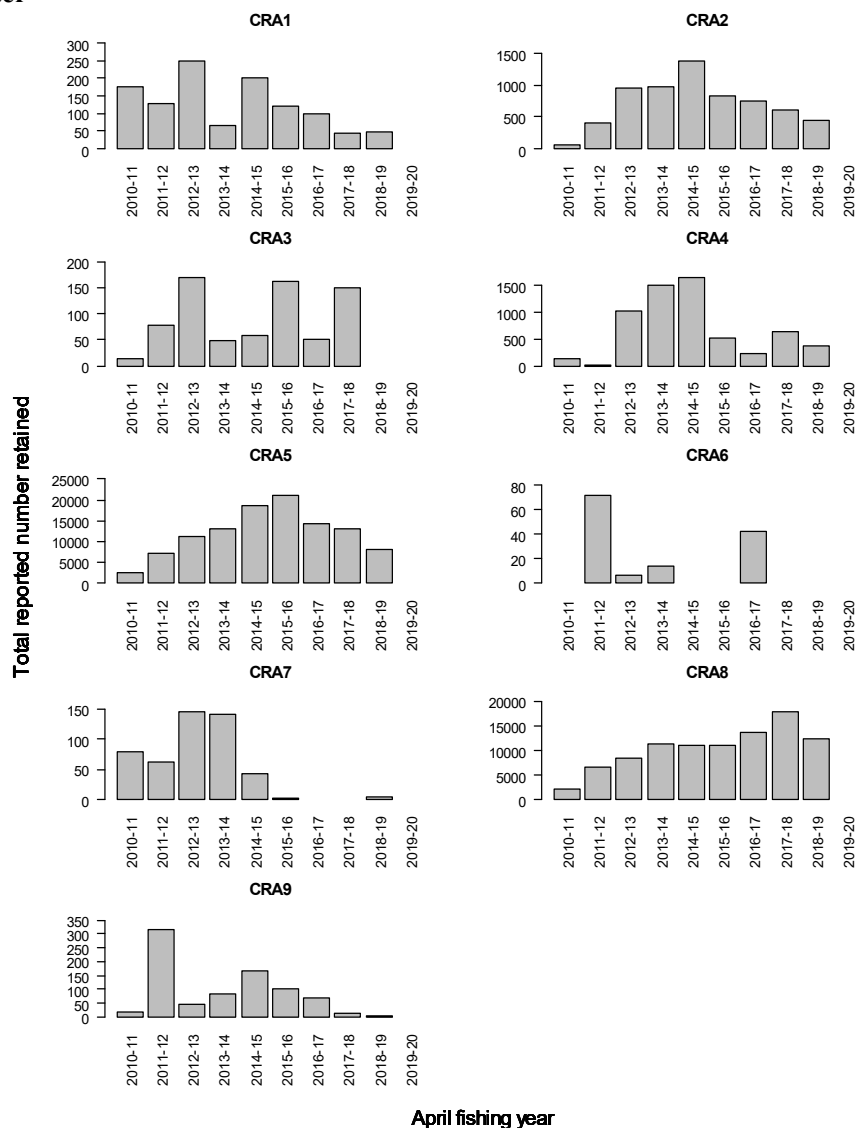


Figure 5: Total reported number of rock lobster retained by Quota Management Area by April fishing year. Data for the 2018–19 April fishing year may be incomplete. No data were reported for 2019–20 by the time of extract (May 2019).

Table 6: Proportion of the reported rock lobster catch that is retained, based on summary tables of the number of fish caught and the number retained, by QMA by April fishing year. Data for 2018–19 may be incomplete.

QMA	2010–11	2011–12	2012–13	2013–14	2014–15	2015–16	2016–17	2017–18	2018–19
CRA 1	0.65	0.67	0.57	0.54	0.68	0.57	0.96	0.71	0.55
CRA 2	0.58	0.63	0.49	0.61	0.85	0.75	0.82	0.80	0.70
CRA3	0.50	0.60	1.00	0.86	0.73	0.76	0.81	0.64	–
CRA 4	0.83	0.33	0.81	0.89	0.89	0.91	0.94	0.92	0.82
CRA 5	0.56	0.32	0.39	0.31	0.29	0.26	0.30	0.26	0.20
CRA 6	–	1.00	0.35	1.00	–	–	0.95	–	–
CRA 7	1.00	0.62	0.83	0.50	0.90	0.50	–	–	0.10
CRA 8	0.71	0.74	0.75	0.72	0.75	0.77	0.76	0.79	0.80
CRA 9	1.00	0.92	0.37	0.74	0.89	0.91	0.81	1.00	1.00

Kingfish

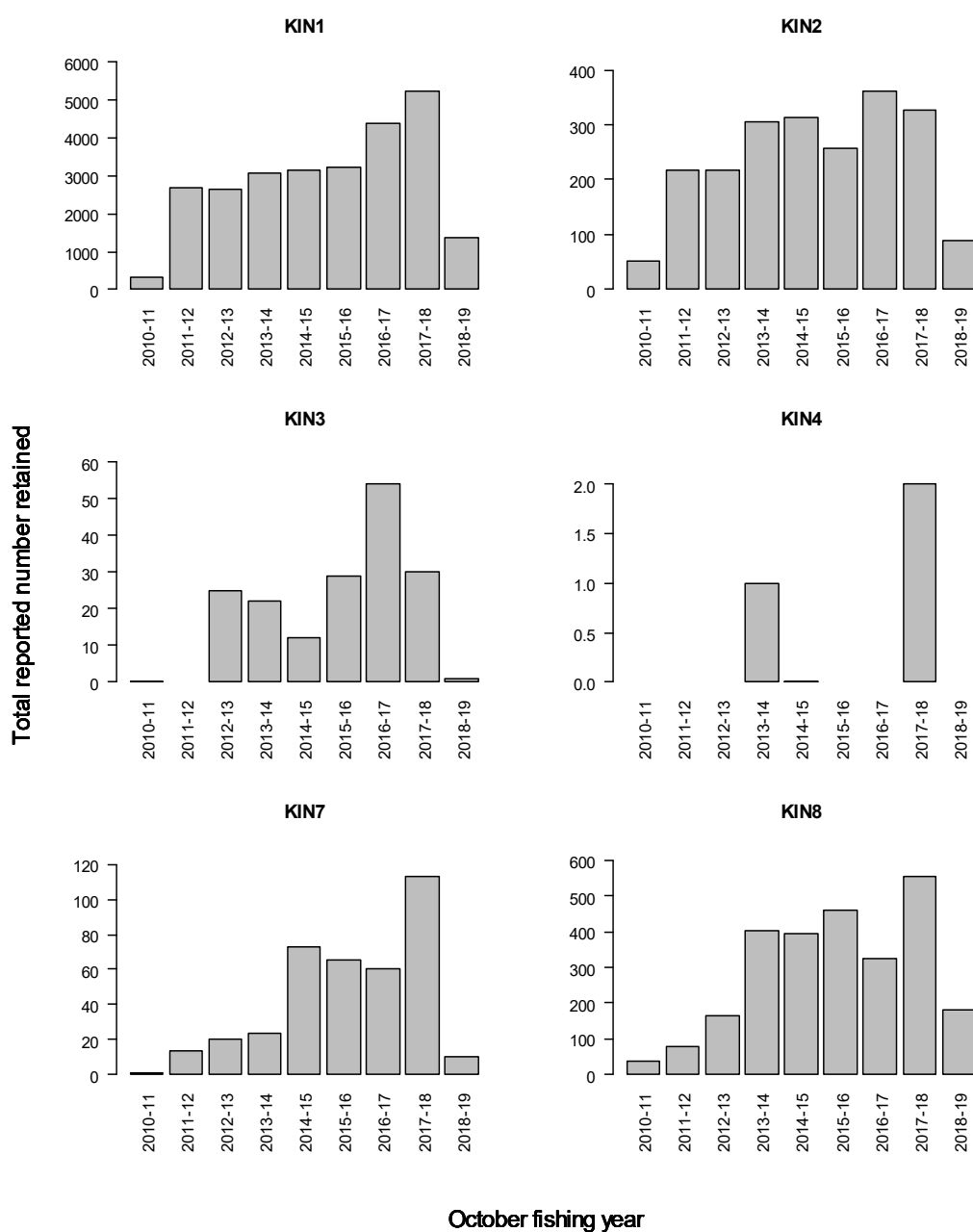


Figure 6: Total reported number of kingfish retained by Quota Management Area by October fishing year. Data for the 2018–19 October fishing year are incomplete.

Table 7: Proportion of the reported kingfish catch that is retained, based on summary tables of the number of fish caught and the number retained, by QMA by October fishing year.

QMA	2010–11	2011–12	2012–13	2013–14	2014–15	2015–16	2016–17	2017–18	2018–19
KIN 1	0.16	0.20	0.26	0.27	0.26	0.20	0.27	0.27	0.30
KIN 2	0.33	0.28	0.08	0.09	0.07	0.12	0.23	0.28	0.17
KIN 3	0.00	–	0.78	0.67	0.26	0.35	0.70	0.88	1.00
KIN 4	–	–	–	1.00	0.00	–	–	1.00	–
KIN 7	0.25	0.67	0.54	0.23	0.37	0.33	0.52	0.41	0.59
KIN 8	0.24	0.13	0.10	0.08	0.07	0.10	0.08	0.11	0.20

Most of the bluefin tuna catch reported by charter boats skippers since 2010–11 has come from off the West Coast of the South Island. Pacific bluefin are caught from boats based at Greymouth and Westport, that fish among trawlers targeting schools of spawning hoki. Most of the reported charter boat catch of southern bluefin tuna is taken off Fiordland. Some skippers have misinterpreted how they should report released fish vs. retained fish. The reported number of retained fish was greater than the reported number of caught fish, in 2014–15 and 2015–16, resulting in calculated release rates greater than 1.0 (Table 9), which should not be possible.

Pacific bluefin tuna

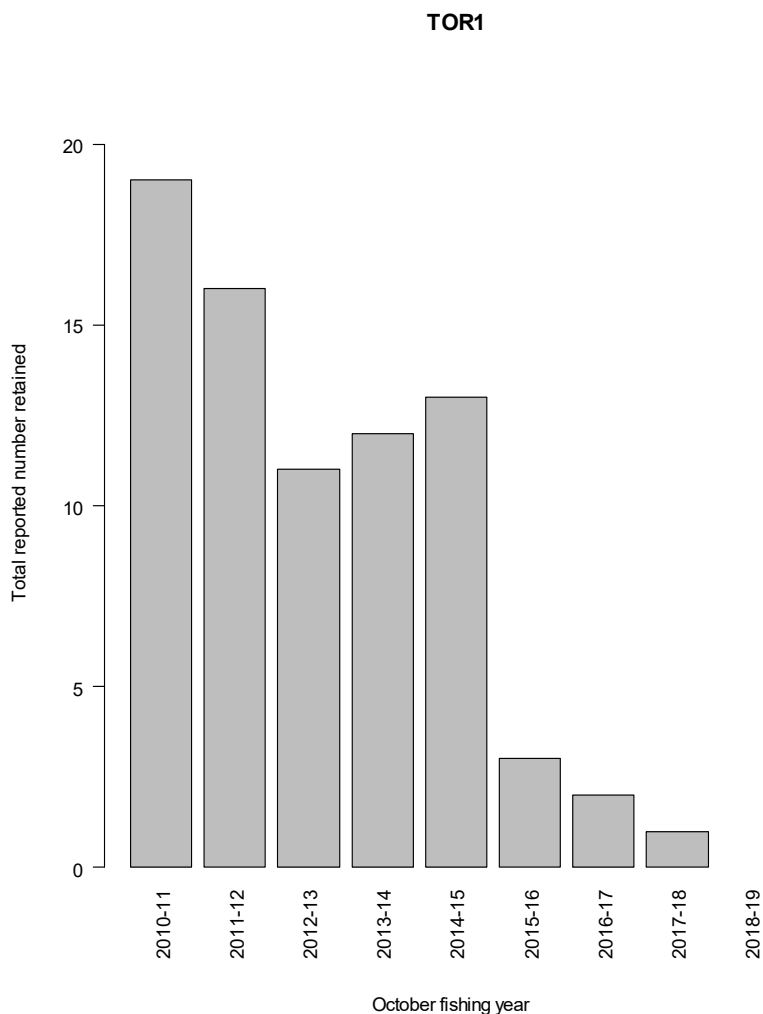


Figure 7: Total reported number of Pacific bluefin tuna retained by Quota Management Area by October fishing year. Data for the 2018–19 October fishing year are incomplete.

Table 8: Proportion of the reported Pacific bluefin tuna catch that is retained, based on summary tables of the number of fish caught and the number retained, by QMA by October fishing year. Data for 2018–19 are incomplete. Data for 2018–19 are incomplete, with no records received before May 2019.

QMA	2010–11	2011–12	2012–13	2013–14	2014–15	2015–16	2016–17	2017–18
TOR 1	0.51	0.47	0.39	0.46	0.43	1.00	1.00	1.00

Southern bluefin tuna

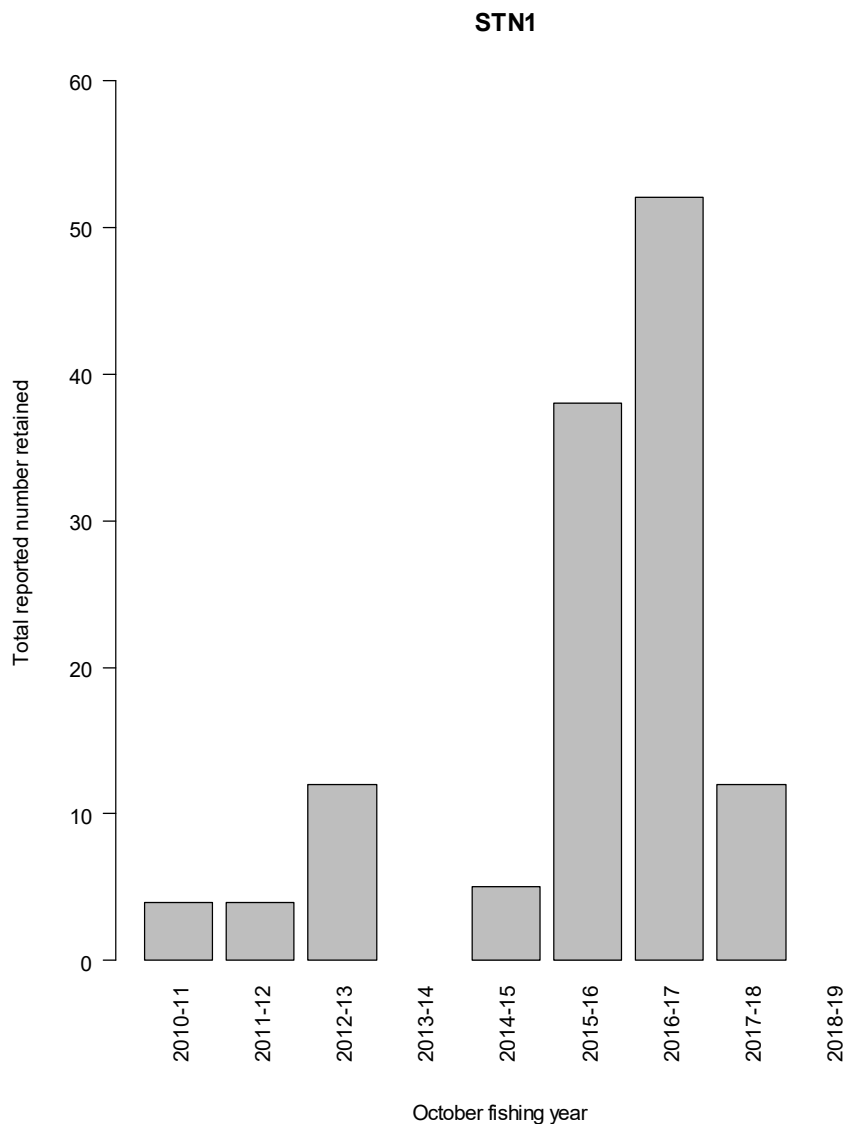


Figure 8: Total reported number of southern bluefin tuna retained by Quota Management Area by October fishing year. Data for the 2018–19 October fishing year are incomplete, with no records received before May 2019.

Table 9: Proportion of the reported southern bluefin tuna catch that is retained, based on summary tables of the number of fish caught and the number retained, by QMA by October fishing year. Data for 2018–19 are incomplete, with no records received before May 2019.

QMA	2010–11	2011–12	2012–13	2013–14	2014–15	2015–16	2016–17	2017–18
STN 1	0.67	0.67	1.00	–	3.80	1.33	0.22	0.00

Catch summaries can also be generated for other commonly caught species for which catch reporting is not compulsory, such as snapper (SNA) and tarakihi (TAR), but trends in these data may reflect changes in voluntary reporting behaviour rather than changes in total charter catch. Summary species catch tables can also be generated for smaller scale management areas of interest to fisheries managers, as defined in Appendix 3.

3.4 Reported catch weight data

More catch weight data are provided by charter boat skippers than are mandated, but it appears to be useful for only some species. The instructions for the ACV-ACR logbook state that skippers are required to give weight estimates for southern and Pacific bluefin tuna only, and to report the best estimate of each individual fish to the nearest kilogram (including released fish). Skippers are also asked to record the catch weight of each tuna on a separate line and to leave this box blank for all other species. In practice, estimated catch weights are reported for over 70% of catch records, but less than 0.2% of these weights are for bluefin tuna species. Often these weight estimates appear to be for the catch of all fish of a given species, rather than for individual fish. For most records these catch weight estimates will be for the retained catch, but there are many instances where the weights appear to be for all fish caught, including released fish.

Some of the confusion about how catches should be reported may come about because many charter boat skippers were formerly commercial fishers. They may be interpreting the catch component of the AFCV-ACR in a similar way to the commercial catch reporting log books they previously filled out and reporting the catch of all commonly caught species, for all individual fish combined.

The requirement for skippers to report catch numbers (caught and retained) for all species, on the same part of the form where they are asked to record the weights on individual southern and Pacific bluefin tuna is likely to cause confusion. It is recommended that, when individual fish weights are required, they should be reported on a separate part of the form.

It is hard to assess the reliability of weight estimates provided for multiple fish combined. Estimating fish weight is less of an issue for commercial fishers because their catch is usually packed into standard-sized fish bins, and Licensed Fish Receivers subsequently provide skippers with measured catch weights that they can use to fine tune their ability to estimate catch weights. On many charter boats, however, client anglers keep their catch separate, so the aggregated weight estimate reported by a charter boat skipper for a given species is likely to be a guestimate based on what they see coming on board and in individual chilly bins.

Given these issues, it is not surprising that the relationship between the reported number of fish retained during a fishing event and the estimated weight of that catch is poor for most species (Figure 9).

Some of the individual fish weights reported by charter boat skippers may still be useful, however, for some species. Mean fish weight estimates are often used to convert survey estimates of numbers of fish caught to total harvest weights (Davey et al. 2019). Mean weight estimates can be derived from AFCV-ACR data, for some of the larger species, when an analysis is restricted to those records where an estimated weight is recorded for an individual fish (Figure 10). Catch rates for these larger species tend to be lower, and their weight is more likely to be recorded one fish at a time. The available data suggest that reasonably informative mean weight estimates could be derived for HPB, HAP, BAS, STM (striped marlin), BNS, TOR, STN, and KIN. These estimates could be used to convert reported numbers of fish caught or retained for these species into estimates of the charter boat catch tonnage taken from fish stocks where sufficient data are available.

The number of reported individual fish weight estimates available for most years in most QMAs is limited for most species, although it may be possible to derive usable annual mean weight estimates for the KIN 1 & 8 and HPB 1, 2, 3, & 5 fish stocks (Table 10). These totals include fish with weights that are greater than the upper 95th percentile, which have been excluded in Figures 9 & 10 because some extreme values were probably recording errors. Upper plausible weight limits should be implemented for each stock if this approach is to be used to derive annual mean weight and total catch weight estimates for these stocks. These results suggest that there is merit in requiring skippers to record estimated individual fish weights for a small number of other species, such as hapuku/bass, kingfish, and bluenose, in addition to the current reporting requirement for southern and Pacific bluefin tuna weights.

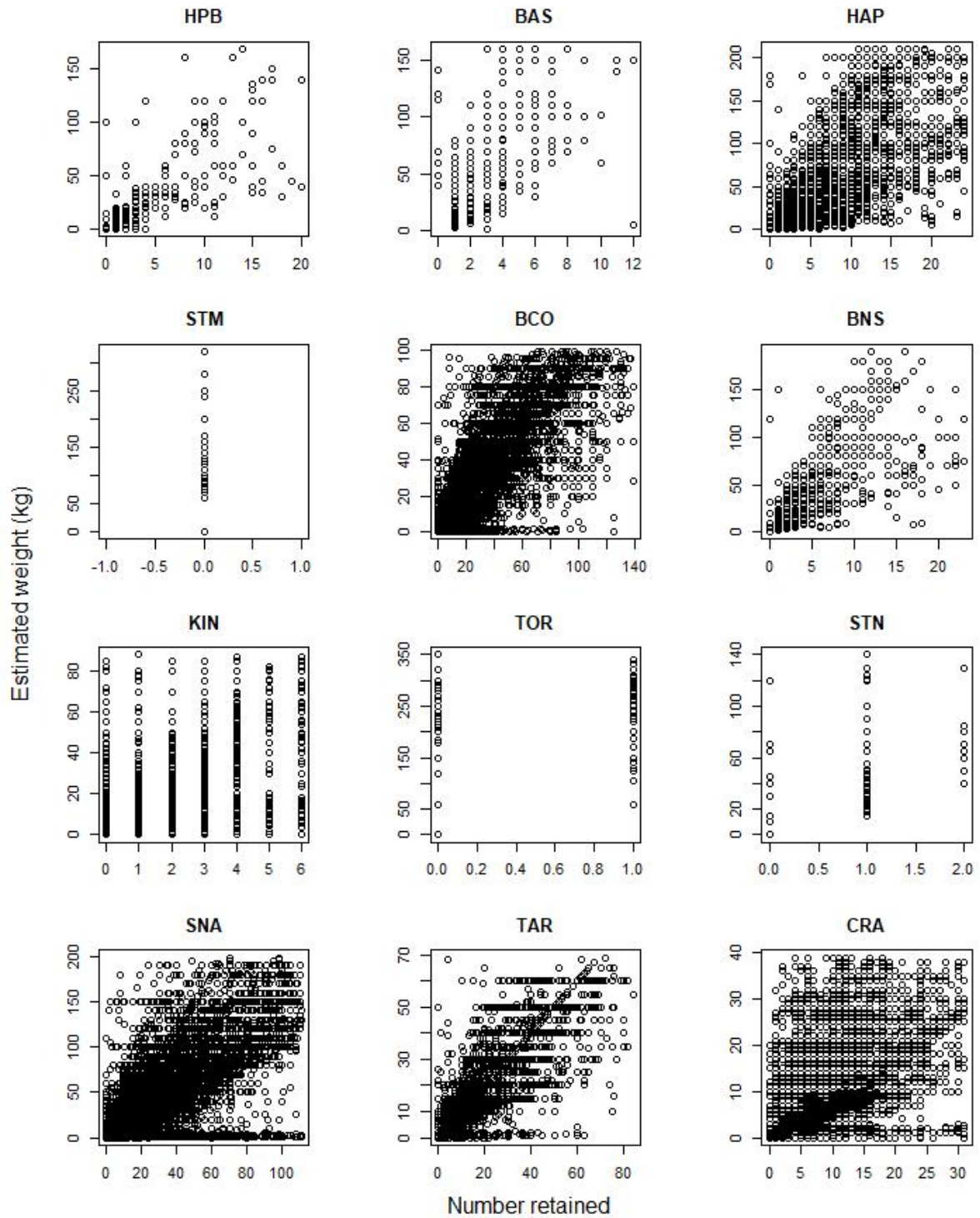


Figure 9: The relationship between the reported number of fish retained during a fishing event and the associated reported estimated weight, for the eight species for which catch weights are required and for SNA. Records with values greater than the upper 95th percentiles for catch weights and numbers have been excluded because these extreme outliers are probably reporting errors.

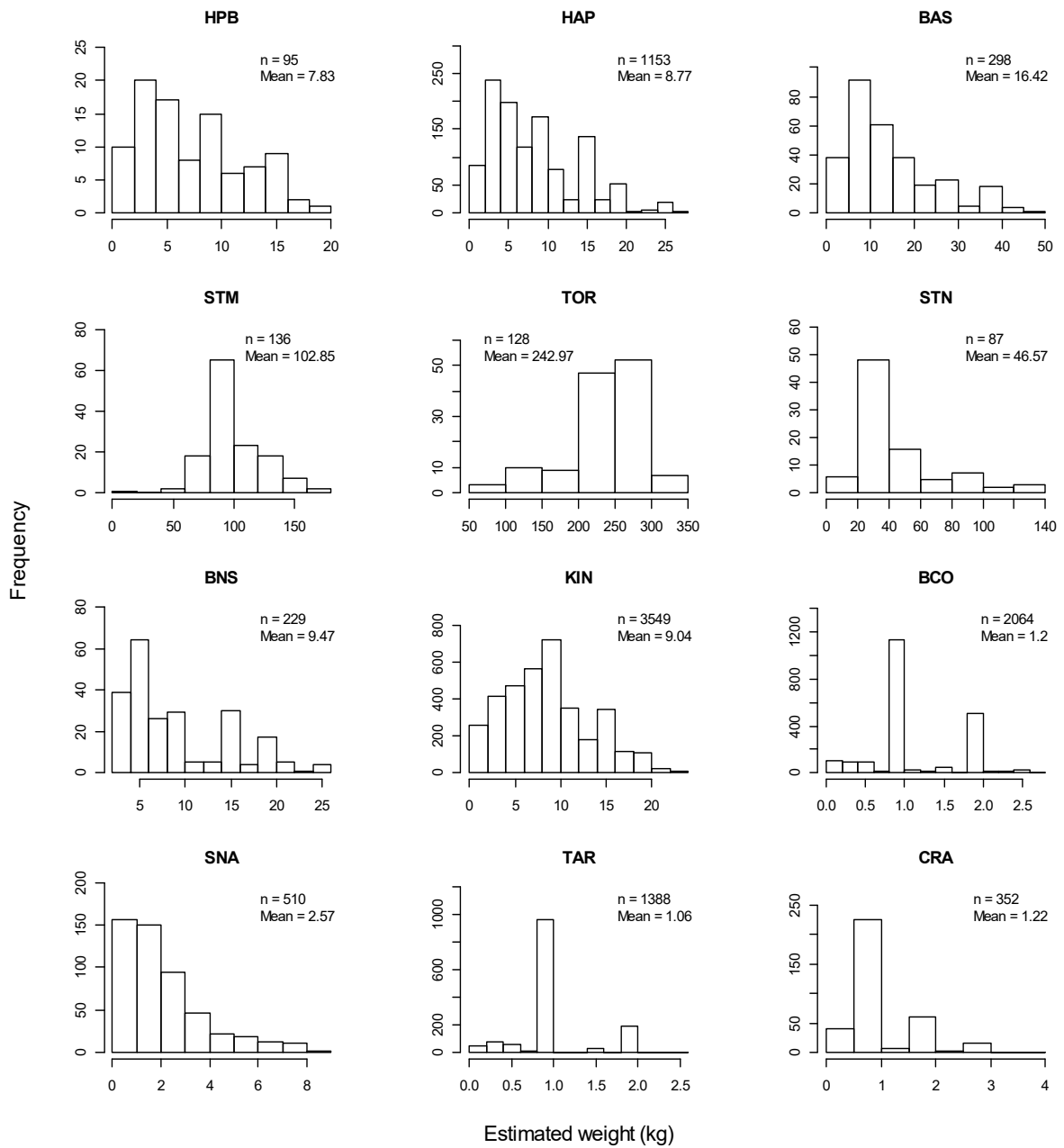


Figure 10: Estimated weight frequencies for commonly caught species and larger species where estimated weights were reported for a single fish. Records with values greater than the upper 95th percentile have been excluded because these extreme outliers are possibly reporting or data entry errors.

Table 10: Number of individual fish weight estimates available by fishing year for each fish stock. Totals for the HPB stocks are for fish recorded as HAP, BAS, and HPB combined.

Fishing year	QMA	Nos caught	Nos retained	Mean wt (kg)	Fishing year	QMA	Nos caught	Nos retained	Mean wt (kg)	Fishing year	QMA	Nos caught	Nos retained	Mean wt (kg)
2010-11	BNS1	2	2	9.50	2010-11	KIN7	2	1	16.00	2010-11	HPB5	22	21	9.82
2011-12	BNS1	3	3	9.00	2011-12	KIN7	2	1	8.00	2011-12	HPB5	35	34	9.14
2012-13	BNS1	7	7	9.57	2012-13	KIN7	3	0	9.33	2012-13	HPB5	33	33	8.91
2013-14	BNS1	10	10	5.50	2013-14	KIN7	1	1	12.00	2013-14	HPB5	40	40	10.19
2014-15	BNS1	13	13	9.62	2014-15	KIN7	2	2	10.00	2014-15	HPB5	36	34	7.15
2015-16	BNS1	13	13	9.15	2015-16	KIN7	1	1	20.00	2015-16	HPB5	35	35	8.83
2016-17	BNS1	8	8	8.94	2016-17	KIN7	4	3	14.50	2016-17	HPB5	36	35	10.38
2017-18	BNS1	8	8	9.50	2017-18	KIN7	2	0	11.50	2017-18	HPB5	29	28	9.41
2018-19	BNS1	1	1	8.00	2018-19	KIN7	1	1	10.00	2018-19	HPB5	4	4	6.50
2010-11	BNS2	1	1	4.00	2010-11	KIN8	8	8	12.38	2010-11	HPB7	13	13	9.62
2011-12	BNS2	1	1	15.00	2011-12	KIN8	8	7	15.00	2011-12	HPB7	17	16	16.00
2013-14	BNS2	10	10	15.80	2012-13	KIN8	18	16	13.39	2012-13	HPB7	10	10	13.80
2014-15	BNS2	9	9	13.56	2013-14	KIN8	23	18	10.11	2013-14	HPB7	5	5	6.40
2015-16	BNS2	9	9	12.11	2014-15	KIN8	48	33	8.97	2014-15	HPB7	7	7	10.00
2016-17	BNS2	3	3	20.00	2015-16	KIN8	39	31	9.64	2015-16	HPB7	6	6	11.50
2017-18	BNS2	4	4	8.50	2016-17	KIN8	22	16	9.88	2016-17	HPB7	6	6	15.83
2018-19	BNS2	2	2	13.00	2017-18	KIN8	62	54	11.18	2017-18	HPB7	6	6	11.17
					2018-19	KIN8	7	5	11.14	2018-19	HPB7	2	2	8.00
2010-11	BNS3	7	7	12.14	2010-11	HPB1	14	13	9.57	2010-11	HPB8	2	2	13.50
2011-12	BNS3	5	5	4.00	2011-12	HPB1	83	77	13.54	2011-12	HPB8	2	2	8.00
2012-13	BNS3	23	23	6.50	2012-13	HPB1	117	94	10.66	2012-13	HPB8	3	3	8.17
2013-14	BNS3	31	31	11.58	2013-14	HPB1	110	109	11.92	2013-14	HPB8	3	3	10.67
2014-15	BNS3	28	28	9.25	2014-15	HPB1	83	83	9.29	2014-15	HPB8	3	3	7.00
2015-16	BNS3	11	9	16.61	2015-16	HPB1	82	81	13.09	2015-16	HPB8	9	9	5.33
2016-17	BNS3	9	9	7.28	2016-17	HPB1	50	50	14.91	2016-17	HPB8	2	2	8.00
2017-18	BNS3	13	13	10.27	2017-18	HPB1	71	71	12.50	2017-18	HPB8	1	1	12.00
2011-12	BNS7	1	1	6.00	2018-19	HPB1	7	7	5.57					
2010-11	KIN1	62	35	8.30	2010-11	HPB2	7	7	8.43	2010-11	STN1	4	3	85.75
2011-12	KIN1	310	158	8.86	2011-12	HPB2	15	13	12.20	2011-12	STN1	4	2	56.50
2012-13	KIN1	331	187	8.43	2012-13	HPB2	22	22	15.95	2012-13	STN1	4	4	73.75
2013-14	KIN1	362	227	10.49	2013-14	HPB2	35	35	18.51	2014-15	STN1	8	3	68.50
2014-15	KIN1	437	262	11.05	2014-15	HPB2	29	29	13.14	2015-16	STN1	18	18	53.72
2015-16	KIN1	392	194	10.42	2015-16	HPB2	29	29	16.17	2016-17	STN1	45	43	42.20
2016-17	KIN1	495	361	10.85	2016-17	HPB2	37	37	23.27	2017-18	STN1	7	7	59.29
2017-18	KIN1	579	417	9.47	2017-18	HPB2	44	43	20.77	2010-11	TOR1	34	16	250.79
2018-19	KIN1	33	26	10.36	2018-19	HPB2	1	1	12.00	2011-12	TOR1	25	9	256.80
										2012-13	TOR1	23	10	254.00
2010-11	KIN2	4	4	12.50	2010-11	HPB3	11	11	7.59	2013-14	TOR1	15	8	291.67
2011-12	KIN2	9	7	13.33	2011-12	HPB3	24	22	5.52	2014-15	TOR1	29	13	200.97
2012-13	KIN2	9	9	14.00	2012-13	HPB3	46	45	9.91	2015-16	TOR1	3	3	296.33
2013-14	KIN2	17	14	14.35	2013-14	HPB3	62	62	8.08	2016-17	TOR1	2	2	240.00
2014-15	KIN2	11	11	15.18	2014-15	HPB3	70	70	6.66	2017-18	TOR1	1	1	300.00
2015-16	KIN2	17	17	18.53	2015-16	HPB3	42	42	6.62					
2016-17	KIN2	20	20	18.70	2016-17	HPB3	28	28	7.53					
2017-18	KIN2	40	35	15.62	2017-18	HPB3	33	33	6.98					
2018-19	KIN2	4	4	17.00	2018-19	HPB3	3	3	20.00					
2012-13	KIN3	1	1	18.00	2012-13	HPB4	3	3	7.00					
2013-14	KIN3	1	1	30.00	2013-14	HPB4	3	3	7.67					
2014-15	KIN3	5	4	6.84	2014-15	HPB4	3	3	13.00					
2015-16	KIN3	8	6	11.50	2016-17	HPB4	4	4	7.50					
2016-17	KIN3	2	2	15.00	2017-18	HPB4	8	8	7.25					
2017-18	KIN3	11	10	9.82	2018-19	HPB4	1	1	6.00					

Mean weight estimates for the smaller species, such as SNA, BCO, and CRA should not be used, however, because it appears that estimated weights are usually reported to the nearest half or whole kilogram and are therefore not reported to a suitable level of precision. Mean weight estimates from creel surveys could be used for the smaller more commonly caught species (see Davey et al. 2019). Mean weight estimates for these smaller inshore fish stocks usually change gradually over time and may still be reasonably accurate despite being relatively dated. The length compositions of SNA 1 snapper measured during creel surveys at boat ramps and on charter boats in 2004–05, 2005–06, and 2006–07 were very similar (Holdsworth & Boyd 2008a, 2008b), and this is likely to be so for other popular target species in other FMAs. More reliable individual weight data are available for striped marlin, where the weight of individual fish caught by charter boats is routinely weighed on certified club scales.

4. SURVEY OF CHARTER BOAT SKIPPERS

4.1 Characterisation of survey respondents

A survey of charter vessel operators was designed in consultation with fisheries managers and scientists from Fisheries New Zealand and hosted on the Survey Monkey website. An invitation to participate in the survey was emailed to all registered charter vessel operators by FishServe, on 1 May 2019, with the survey lasting for 16 days. A total of 94 responses were received from as far afield as Houhora to Bluff and Kawhia to Chatham Islands, representing 40% of the 230 registered charter operators currently (as at May 2019) operating 262 registered vessels. The distribution of respondents across FMAs was similar to the distribution of registered charter vessels (Figure 11). Over 50% of respondents were based in FMA 1, with about 11% each located in FMAs 2, 3, and 5.

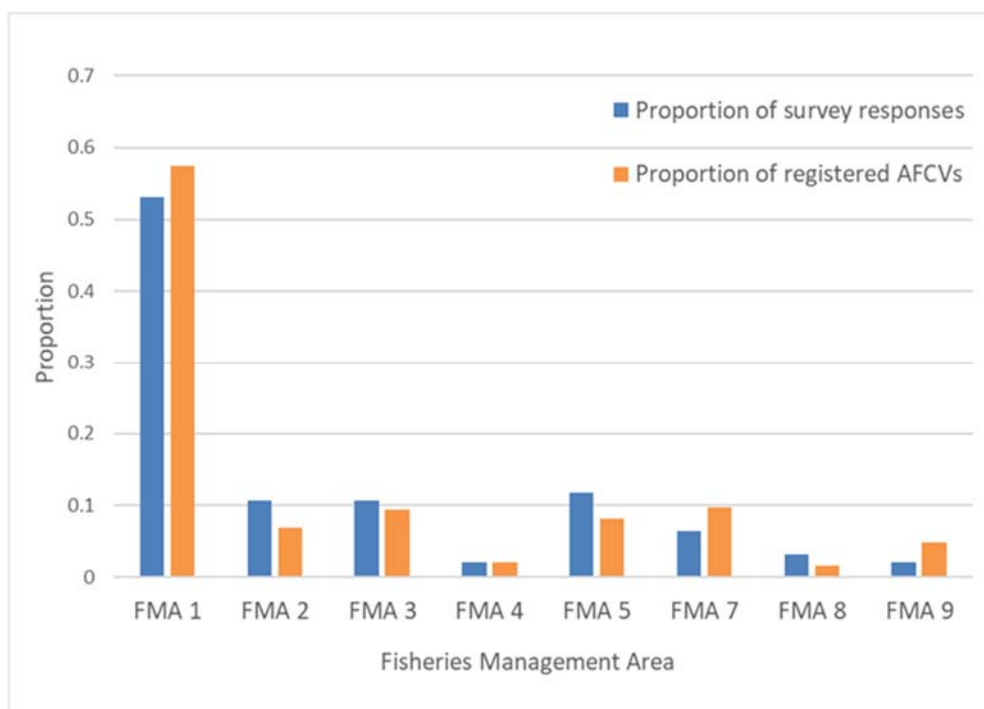


Figure 11: The proportion of survey responses and registered vessels by Fisheries Management Area.

There was a wide spread of experience among charter operators. Only 10% of the respondents had been operating charter vessels for 2 years or less, with a third chartering for 20 years or more (Figure 12). The average operating experience of the respondents was 15 years.

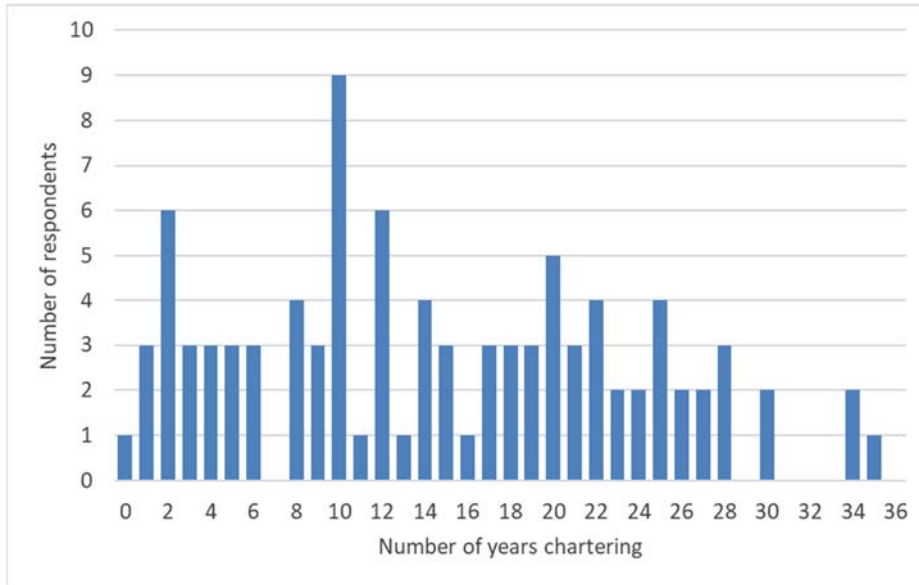


Figure 12: The reported number of years respondents had been operating a charter business.

Respondents were asked to characterise the services they offer to clients. Almost all (94%) provided line fishing charters and a third did some game fishing (Figure 13). About a fifth provided free-diving and SCUBA diving with the “other” category including: bird watching, cray fishing, ecotourism and eco-heritage experiences, oyster dredging, bird watching, sightseeing, and marine mammal watching.

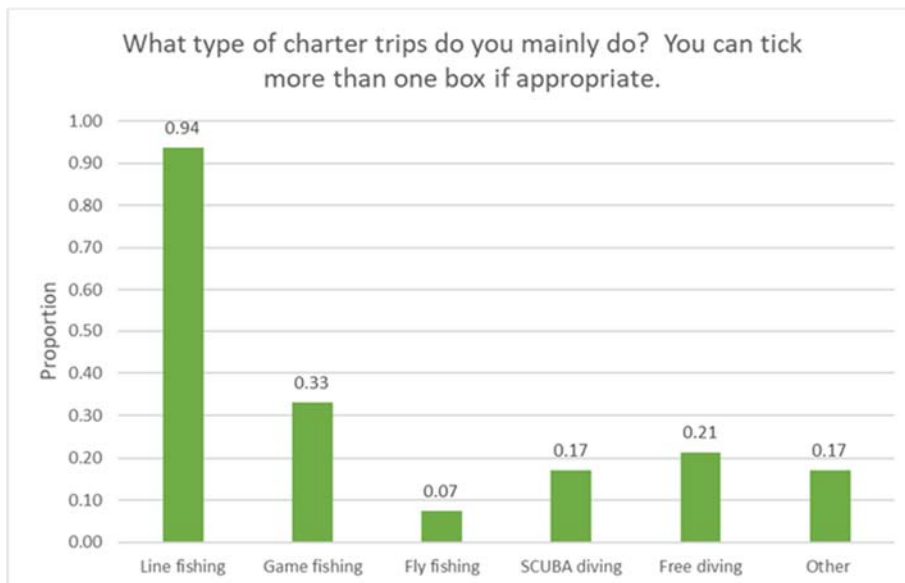


Figure 13: The main type of charter activates offered by respondents.

A high proportion (88%) of respondents said that the instructions given in the logbook were clear and adequate, and 84% said they were able to get further clarification on how to fill out their returns if they needed it. However, only half of respondents found the reporting system easy to use, with many complaining about paper-based data corrections sent by post for minor omissions.

4.2 Responses to questions about the current reporting system

Charter vessel operators are instructed to enter new fishing event information if they change fishing location by more than 6 nautical miles, or they change fishing method or target species. This can result in multiple event entries for a single trip. A few fishers (15%) said they did not do this, but two thirds said they did (or possibly didn't need to on simple one-method trips) (Figure 14).

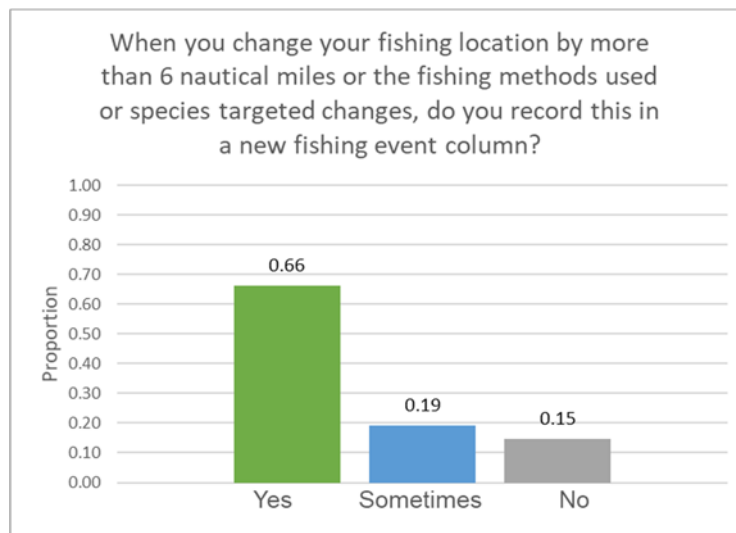


Figure 14: Proportion of respondents who record changes in fishing location as separate events, as instructed.

Charter operators are required to report individual weights of southern bluefin tuna and Pacific bluefin tuna that they catch. Many operators use this part of the form to voluntarily enter the weights of fish. Respondents who record weights were asked what they wrote down, with 45% recording the weight of retained fish only, and 22% recording the weight of both retained and released fish (Figure 15). Recording may vary by species or catch on a trip, with 24% of respondents stating that it depended on the situation whether they included released fish in the weight estimate.

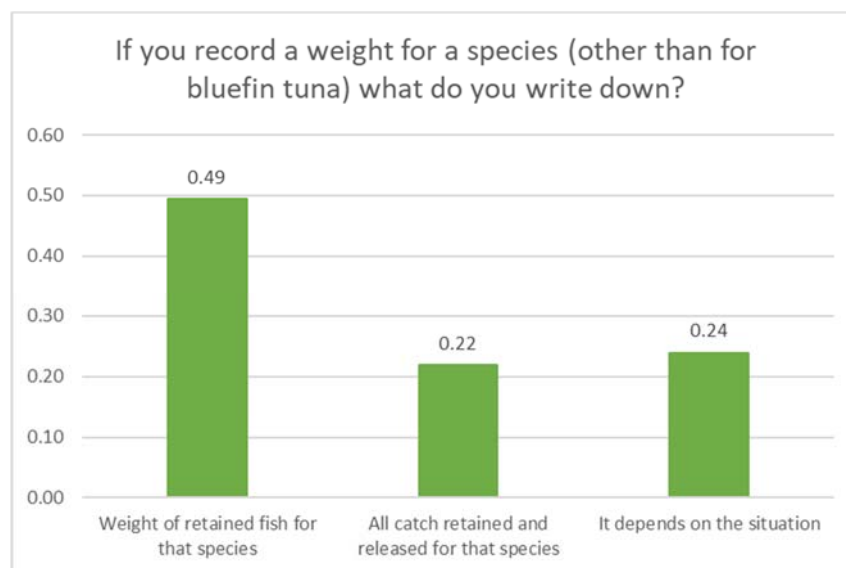


Figure 15: The proportion of respondents who voluntarily record weight of the catch as retained fish only or retained and released fish.

Most respondents had been visited by a fisheries officer within the last six months (Figure 16).

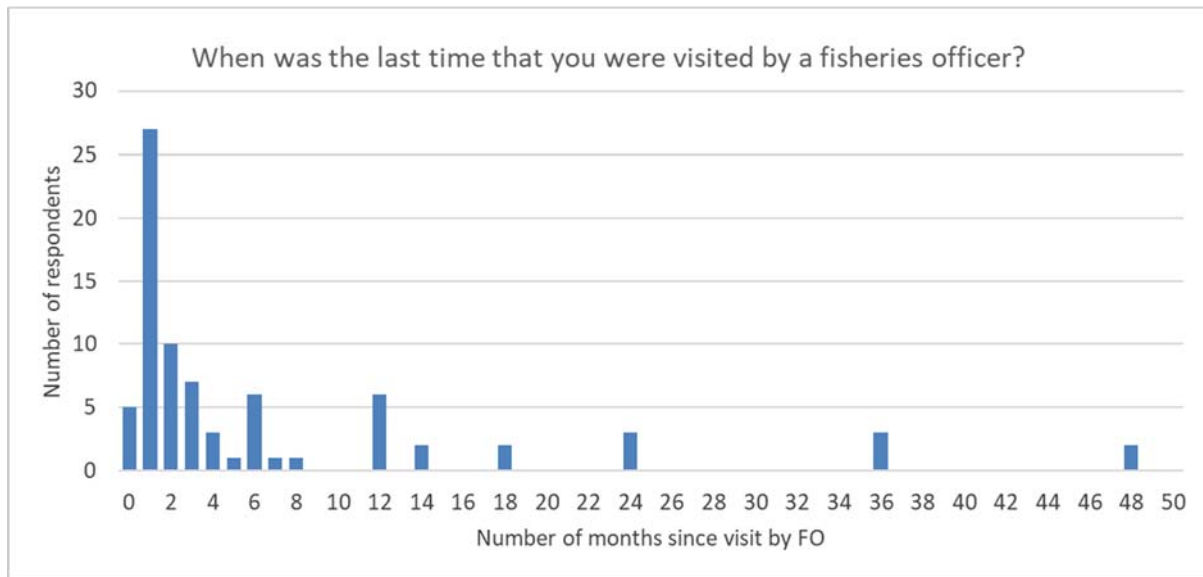


Figure 16: The number of months since respondents were visited by a fisheries officer.

Respondents were asked whether it would be feasible for all charter operators to report the number of fish caught (including released fish) and the number retained, for species which they are not currently required to record. Forty-four percent of respondents thought it was feasible to report the number of snapper and tarakihi retained but only 26% thought it was feasible to report the number of fish released for other species (Figure 17). This is similar to the proportion of charter vessel operators who already record catches of species that they are not currently required to report. A third of all survey participants did not respond to this question, which may indicate their lack of support this type of change.

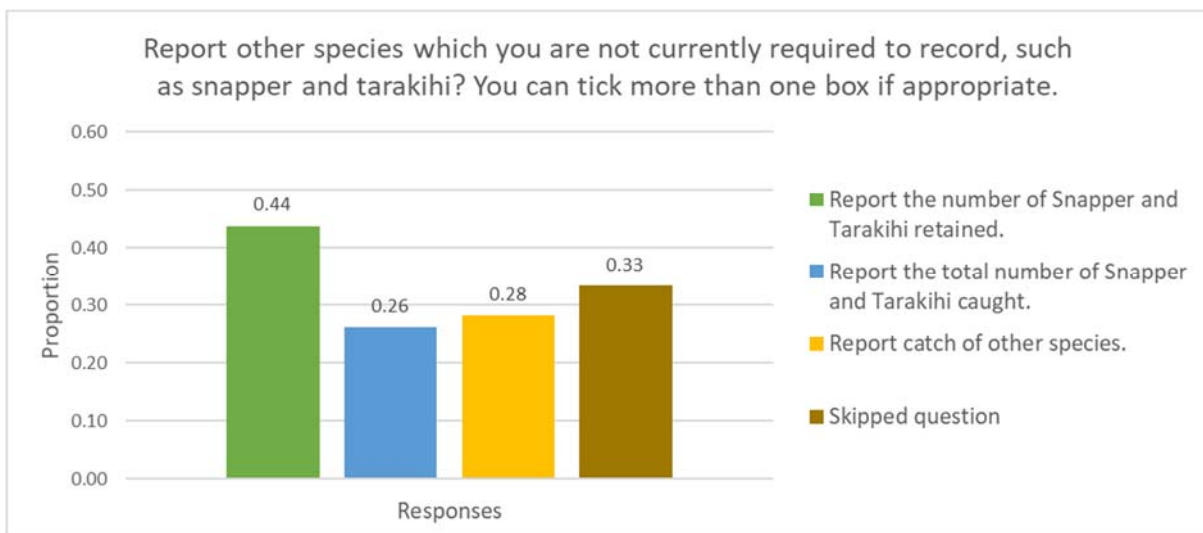


Figure 17: The proportion of respondents who thought reporting of additional species was feasible.

Most respondents (65%) supported the recording of retained catch weights for the species that they currently report catches for (Figure 18). As before, about a third of respondents did not support a requirement to report retained catch weights or skipped the question.

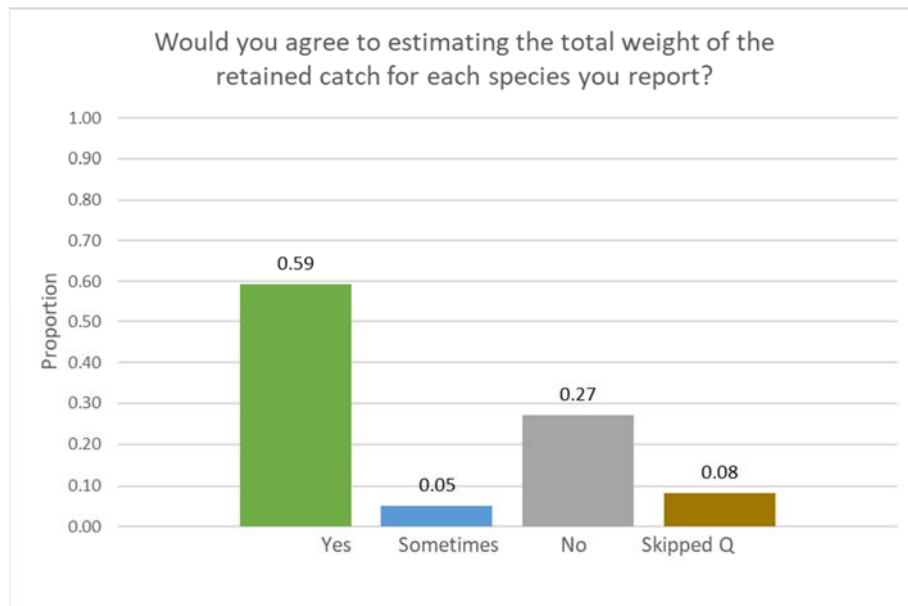


Figure 18: The proportion of respondents who supported estimating the weight of retained catch for the species they have to report.

There was some support for operators recording individual weights for larger fish that are retained, with 36% of respondents agreeing to this for kingfish and 33% for hapuku (Figure 19). However, 51% of respondents did not support collecting individual weights or skipped the question.

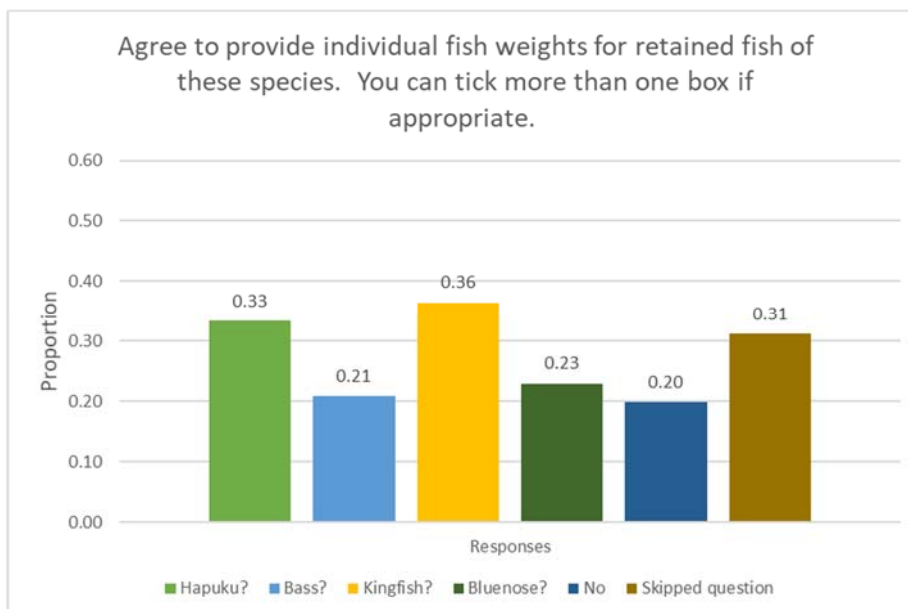


Figure 19: Proportion of responses in support for providing individual weights for some of the larger species.

There has been a widespread adoption of at-sea electronic reporting on commercial vessels since mid-2018. Respondents were asked whether electronic reporting at sea would be feasible for their charter vessel business. There was some support (20%) but most operators (62%) did not think this would be feasible or did not answer the question (Figure 20).

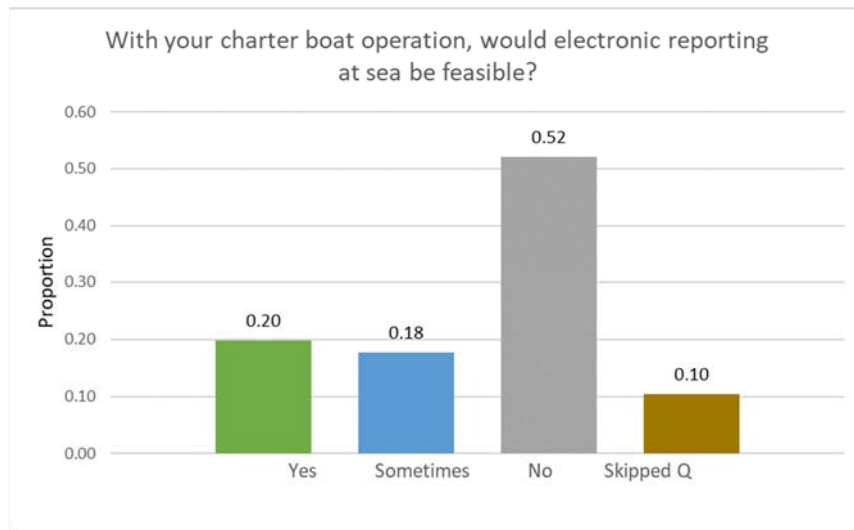


Figure 20: Proportion of respondents who supported electronic reporting at sea.

4.3 Discussion of charter boat operator survey responses

The content of this survey was developed with input from Fisheries New Zealand staff and members of the Marine Amateur Fisheries Working Group. The response rate to the online survey was reasonably high, covering a broad cross section of operator activity, experience, and operational location. Although the results of the survey may be indicative, the 60% of charter boat operators who did not respond may have different views from those who did respond. The survey allowed respondents to skip questions and still complete the survey, and those skipping individual questions may hold different views from those responding to those questions.

Seventy-four percent of respondents provided additional comments at the end of the survey. Many of these comments were about the error correction system. Charter operators have paper forms posted back to them for correction for what they perceived to be minor errors such as a missed letter on a species code, or a latitude and longitude position deemed to be on land, or for trips departing from a port that is not recognised by the system. They are required to post the corrected forms back, but the postal system is becoming less reliable. Although there is little support for moving to electronic reporting at sea, a number of respondents would like to see an online option for correcting errors, and with others wanting to enter or submit their AFCV-ACR data online from their office. Fewer errors would occur if entry options were restricted to eligible species codes and range checks were set for numerical fields. At some stage this may be required given the New Zealand Government’s shift to becoming more responsive, open, citizen-centric, and user-focused through its ICT Strategy (information and communications technology ICT – <https://www.digital.govt.nz/digital-government/strategy>).

Some of the charter operators voluntarily record catch data for species that they are not currently required to report. This information is of limited use, because there is no way of knowing how representative the voluntary (and hence partial) reporting of the catches of these additional species is. Fisheries New Zealand released proposals in June 2019 to include a requirement to report additional species (snapper, tarakihi, scallops, and blue cod in FMA 1) before this project was complete and this report does not consider the results of that consultation process.

Some of the main comments opposing increased reporting requirements were: that AFCV reporting was time-consuming and a waste of time; that the data were not being used; that there were unregistered charter boats operating outside the system and not reporting; and that private recreational fishers were not required to report their catch. Many questioned whether AFCV-ACR was even used to inform fishery management, or how useful the data could be for that purpose. There seems to be a general perception among respondents who offered comments that the time and money spent on collecting this information has had no positive benefit for charter vessel operators.

The logbook instructions ask operators to record the individual weights for each southern bluefin tuna and Pacific bluefin tuna caught, whether these fish are retained or released. There are no instructions on how to record weights for other species other than to leave the weight boxes blank. Responses to the survey have highlighted a variety of ways in which charter boat skippers record catch weights; some just record the retained catch weight whereas others report the weight of all fish caught, including those released. Other respondents stated that catch weight reporting depended on the situation at the time. Fisheries New Zealand proposals released in June 2019 included the suggestion that skippers record the actual or estimated weight of the retained catch of all species for which they are currently required to report catch numbers.

We believe that, if useful data are to be collected, consistent catch reporting from all charter vessel operators is essential regardless of which species and catch reporting format is required. The instructions provided with logbooks should be reviewed if changes to catch reporting requirements or other information are required because skippers only rarely refer to instructions after their first reading. Catch (weight) reporting requirements should also be clearly indicated on the form itself, so they are readily evident. If individual fish catch weights are required for a defined list of species, these weights should not be entered alongside fields where catch numbers are entered for multiple fish, because this leads to ambiguous reporting of catch weights, which may be for one or more than one fish. Any changes to logbook forms should be widely reviewed, including by fisheries officers and members of the Marine Amateur Fisheries Working Group, to make sure they are fit for purpose.

5. SUMMARY OF RECOMMENDATIONS

- Scripts developed as part of this project should be used to groom any AFCV-ACR data before the data are analysed for any purpose, so that data can be interpreted in a consistent fashion and as rapidly as possible.
- Data characterisation scripts also generated as part of this project can then be used to provide an overview of these data to inform any further analysis.
- Data summaries, including those described in this report, should be used as the basis for an annual report sent to registered charter boat operators. Demonstrating the value of the data collected will encourage better quality reporting. This report could also be distributed to charter vessel operators.
- Summaries of AFCV-ACR data could be incorporated into annual plenary reports, for those species where the charter boat catch is a significant proportion of the overall harvest.
- Analyses presented in this report suggest that charter boat operators have varying interpretations of how parts of the AFCV-ACR reporting form should be completed, especially catch weight reporting. The AFCV-ACR form should be reviewed and redesigned to improve reporting accuracy and consistency, based on consultations with a sample of charter boat skippers, fisheries managers, fisheries officers, and members of the Marine Amateur Fisheries Working Group.

- Options for electronic data submission and/or data correction should be developed. The current paper-based system needs to be retained as an option for charter vessel operators without computer skills.

6. ACKNOWLEDGMENTS

The authors would like to thank the charter boat operators who responded to the survey described in this report. The authors would also like to thank Graham McGregor, Mark Geytenbeek, and Alicia McKinnon for the advice they gave on summary outputs that fisheries managers would find of most use. This work was funded by the Fisheries New Zealand project MAF-2018/03.

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APPENDIX 1: AFCV-ACR LOGBOOK INSTRUCTIONS AND REPORTING FORM

Amateur-Fishing Charter Vessel – Activity Catch Return

Required pursuant to the Fisheries (Amateur Fishing) Regulations 2013

MPI client number

**To Reorder:
Request Book Number 19**

New books can be ordered online at
charteroperator@finnz.com

Call 0800 422 843 for further information on
any forms contained within

Please send completed forms to FINNZ,
PO Box 24 441, Wellington 6142, New Zealand

Codes to be used on Amateur Fishing Charter Vessel — Activity Catch Return (ACV-ACR)

Report the species you are primarily trying to catch

Main Target Species Codes (section 3)

Common name	Species code
Albacore tuna	ALB
Bait (all species targeted as bait)	BAI
Bass	BAS
Black marlin	BKM
Barracouta	BAR
Blue cod	BCO
Blue marlin	BEM
Blue moki	MOK
Blue shark	BWS
Bluenose	BNS
Bronze whaler shark	BWH
Butterfish	BUT
Cockle	COC
Dredge oyster	OYU
Garfish/piper	GAR
Green-lipped mussel	GLM
Hapuku (Groper)	HAP
Jack mackerel	JMA
John dory	JDO
Kahawai	KAH
Kina	SUR
Kingfish	KIN
Mako shark	MAK
Pacific bluefin tuna	TOR
Packhorse rock lobster	PHC
Paua (all species)	PAU
Pilchard	PIL
Pipi	PPI
Red gumard	CUR
Red moki	RMO
Rock lobster (spiny red)	CRA
Scallop	SCA

Main Target Species Codes (section 3) continued

Common name	Species code
Sea perch	SPE
Skipjack tuna	SKJ
Snapper	SNA
Southern bluefin tuna	STN
Striped marlin	STM
Swordfish / Broadbill	SWO
Tarakihi	TAR
Trevally	TRE
Trumpeter	TRU
Tuatua	TUA
Yellowfin tuna	YFN
Yellow-eyed mullet	YEM

Fishing Method Codes (section 3)

Method Description	Species code
Beach seine/ Drag netting	BS
Bottom longlining	BLL
Diving (includes SCUBA and free diving)	DI
Dredging	D
Drop/Dahn Lines	DL
Fish traps	FP
Hand gathering	H
Potting other than rock lobster potting	POT
Rock lobster potting	RLP
Rod and reel or hand lining – anchored	HLA
Rod and reel or hand lining – drifting	HLD
Set netting	SN
Trolling	T
Trolling Big Game	TBG

Trolling Big Game (TBG) method code may be used when targeting these species

Big Game Fish Species Codes (section 3)

Common name	Species code
Black marlin	BKM
Blue marlin	BEM
Pacific bluefin tuna	TOR
Southern bluefin tuna	STN
Striped marlin	STM
Yellowfin tuna	YFN

Catch Reporting Species Codes (section 4)

Species	Species code	Fisheries Management Areas (FMAs)
Bass	BAS	All FMAs
Blue cod	BCO	FMA 2, 3, 4, 5, 6, 7, and 8
Bluenose	BNS	All FMAs
Hapuku (Groper)	HAP	All FMAs
Kingfish	KIN	All FMAs
Pacific bluefin tuna	TOR	All FMAs
Rock lobster	CRA	All FMAs
Southern bluefin tuna	STN	All FMAs

Amateur Fishing Charter Vessel – Activity Catch Return

Instructions for Users (October 2010)

INTRODUCTION

The Amateur Fishing Charter Vessel – Activity Catch Return (ACV-ACR) is used to collect information each time you go on an amateur fishing charter vessel fishing trip. This information is important to both amateur fishing charter vessel operators and the Ministry for Primary Industries.

All Amateur Fishing Charter Vessel operators are required to report activity (section 3). **Catch reporting (section 4) is only required for certain species caught in certain areas. See the Catch Reporting Species Codes list for details.**

To ensure data accuracy, please carefully follow these instructions when completing your AFCV-ACR.

The AFCV-ACR book is to be carried on all amateur fishing charter vessel fishing trips.

All information provided is treated as confidential. Information held on any Amateur Fishing Charter Vessel operator is available to that charter operator on request, as required by the Privacy Act.

Overview

One return must be completed for each amateur fishing charter vessel fishing trip. Each page of the return is separated into the following five sections:

- **Section 1** records the page number and total number of pages included in an individual return.
- **Section 2** records the date of fishing, vessel details, vessel operator, and port of departure.
- **Section 3** collects information on fishing activity at each new fishing event.
- **Section 4** collects information on the catch of specific species at each new fishing event. The species and for blue cod only area combinations are included in the Catch Reporting Species Codes list.
- **Section 5** is the declaration section.

General information

- A return is required for each amateur fishing trip. A trip begins when people actively fishing are on board the vessel and finishes when they disembark at the end of the trip.
- One return may consist of more than one page. A new page must be started at the start of each day of a multi-day trip on which fishing occurs, or when more than three fishing events occur on the same day of a trip. A day lasts from midnight to midnight.
- A page must be completed for each day of a charter vessel fishing trip where fishing occurred, including days where fishing occurred but no fish were caught.
- If a vessel undertakes more than one fishing trip in a day then a separate return is required for each trip.
- If a charter vessel is not used for any fishing trips during a calendar month you must send in a single nil return. **To complete a nil return you must complete sections 1, 2 and 5. A nil return will only be a single page in all cases.** Section 2 is completed using the last day of the month to which the nil return applies and the 'Port of departure' box is to be left blank.
- There are specific requirements for completing sections 3 and 4 for the fishing method of trolling for big game fish (TBG). See the 'Specific requirements when trolling for big game fish' section under section 3 below for details.
- You must make sure that your Amateur Fishing Charter Vessel – Activity Catch Returns arrive at FINNZ by the 15th day of the month after the fishing trip ended. For nil returns, make sure that they arrive by the 15th day of the month following the month of the nil return. If the forms are late, you may have to pay a late fee.

Please send completed forms to FINNZ, PO Box 24 441, Wellington 6142, New Zealand

Instructions

Section 1

1. Complete one return (using as many pages as required) for each fishing trip. For multi-day trips each day must start on a new page.

Page of

- You must complete this section on each page of a return, including if the return is only one page.

Section 2

2.	Date of fishing (dd/mm/yy)	MNZ/MSA number of vessel	Name of vessel	MPI operator number	Port of departure	Nil return? Yes <input type="radio"/> No <input type="radio"/>
	/ /					

Date of fishing (dd/mm/yy)

- dd/mm/yy is the date on which the fishing activity and catch information included on the page of the return applies. Note that a new page must be started for each day of a multi-day trip during which fishing occurs.
- When the fishing method involves setting gear (for example potting, fish traps, set netting or bottom long lining) the date is the date at which the pot or trap is retrieved.

MNZ / MSA number

- The Maritime New Zealand registration number of your vessel.

Name of vessel

- The name of the amateur fishing charter vessel.
- The unique identification number assigned to the amateur fishing charter vessel operator by the registration process.

Port of departure

- The port where the vessel departed with people actively fishing at the start of the trip. Note that the port of departure will be the same on all pages of a return, including each page of a multi-day trip return.

Nil return

- If no fishing occurs in a calendar month a nil return is required. Complete all of section 2 apart from the 'Port of departure' box which should be left blank.
- Put the last day of the month in the 'Date of fishing' box and tick 'Yes' in the 'Nil return?' box.
- Sections 1 and 5 also have to be completed for a nil return.

Additional notes on completing section 2:

- You must complete this section on each page of a return.
- You must complete this section before fishing starts on the day to which the page relates.

Section 3

3. Activity Reporting. Complete a new fishing event column each time the fishing location*, fishing method or target species changes.

	New fishing event	New fishing event	New fishing event
Target species			
Fishing method			
People actively fishing			
Latitude: (degrees minutes)	° ' S	° ' S	° ' S
Longitude: (degrees minutes E/W)	° ' E/W	° ' E/W	° ' E/W
Time spent fishing (hh:mm)			

Target species

- Choose the appropriate species code from the Main Target Species Codes list. This should be the species you are primarily trying to catch, not the species of which you catch the most.

Fishing method

- Choose the appropriate fishing method code from the Fishing Method Codes list. Where multiple fishing methods are used at a location, a 'New fishing event' column should be completed for each method.
- See the 'Specific requirements when trolling for big game fish' below for how to complete this box if the fishing method is Trolling Big Game (TBG).

People actively fishing

- Enter the total number of people fishing in the fishing event. This could include the skipper and/or guide if they are fishing.

Latitude and longitude

- Enter the latitude and longitude position for each 'New fishing event' at the point where fishing starts. Position must be in degrees and minutes format and must be recorded to the nearest minute. Preferably positions should be taken directly from the vessel's GPS equipment.

- A new fishing event starts when the vessel moves more than 6 nautical miles from the previous fishing location whether by steaming to the new position or by drifting or trolling over 6 nautical miles from where fishing started. When the 'Fishing method' is trolling (T), record the position where lines were first placed in the water.

- See the 'Specific requirements when trolling for big game fish' below for how to complete this box if the fishing method is Trolling Big Game (TBG).

Time spent fishing

- Enter the period of time spent fishing in a single fishing event in hours and minutes. This is the period from when fishing started to when it finished. The end of a fishing event is usually when the fishing activity stops, but it may also be when the vessel drifts or trolls more than 6 nautical miles from where the fishing event started. In this case, the event should be closed and a new fishing event started.
- When bottom longlining, cod potting, drop/Dahn lining, fish trapping, rock lobster potting or set netting use the soaking time – the period from when pots, traps, nets or lines were set until they were emptied. Note that this period may have started on a previous day.
- See the 'Specific requirements when trolling for big game fish' below for how to complete this box if the fishing method is Trolling Big Game (TBG).

Additional notes on completing Section 3:

- You must complete this section on each page of a return, other than a nil return.
- You must complete this section as soon as is practicable after completing a fishing event and before the next fishing event starts. For example, if you leave a fishing location this section must be completed before fishing starts at a new location. If fishing has been completed for the day you must complete this section before those actively fishing disembark from the vessel or (on a multi-day charter) before the vessel anchors or moors for the night.
- You must fill in all the boxes in this section for the separate column that relates to each fishing event undertaken, regardless of whether any fish are caught or landed. A new fishing event occurs each time:
 - the target species changes (even if the vessel does not move).
 - the fishing method changes (even if the vessel does not move).
 - the fishing location changes by over 6 nautical miles (0.1 degrees of latitude). Note that one location may include all drifting or steaming within 6 nautical miles of the point where fishing started.

Specific requirements when trolling for big game fish:

- The trolling for big game fish method code (TBG) is to be used when trolling for the species listed in the Big Game Fish Species Codes list.
- Trolling for big game fish covers large distances. For the fishing method of TBG only, three new fishing events need to be recorded regardless of how far you move during the day. The first new fishing event records where the lines were first put in the water, the second records the position at noon and the third where the lines were removed from the water at the end of the days fishing.
- For the fishing method of TBG only, the 'Time spent fishing' box should record 00:00 for the first new fishing event, the time spent fishing before noon in the second new fishing event and the time spent fishing after noon in the third new fishing event.
- If the end of fishing occurs before noon, or the start of fishing occurs after noon, only two new fishing events are required. In this situation the 'Time spent fishing' box should record 00:00 for the first new fishing event with the total time spent fishing recorded in the second new fishing event.
- All other fields in Section 3 should be completed as for other fishing methods.
- If a species is caught that requires catch reporting it should be recorded in the appropriate time period in section 4.

Section 4

4. Catch Reporting. Complete one line for each species taken for which reporting is required (see Explanatory Notes for the Catch Reporting Species list).	Species caught	Number caught	Number retained	Estimated weight (kg)	Species caught	Number caught	Number retained	Estimated weight (kg)	Species caught	Number caught	Number retained	Estimated weight (kg)
					.0kg				.0kg			
				.0kg				.0kg				.0kg
				.0kg				.0kg				.0kg
				.0kg				.0kg				.0kg
				.0kg				.0kg				.0kg
				.0kg				.0kg				.0kg
				.0kg				.0kg				.0kg

Species caught

- Choose the appropriate species code from the Catch Reporting Species Codes list (page 2).

Number caught

- Record the total number of the species caught. The number caught includes all fish of that species that are caught and released (including undersize fish).

Number retained

- Record the total number of the species that are retained after being caught.

Estimated weight (for southern and Pacific bluefin tuna only)

- Record the best estimate of weight in kilograms for each fish caught (including released fish) to the nearest kilogram. For these species a separate line must be used for each individual fish. Leave this box blank for all other species.

Additional notes on completing Section 4:

- Please fill in the relevant boxes in a column for each fishing event.
- You are only required to report catch of certain species in certain areas. The species and area combinations for which catch reporting is required are listed in the Catch Reporting Species Codes list. If none of the species in the Catch Reporting Species Codes list are caught, no catch information is required.
- If catch reporting is required, you must complete this section as soon as is practicable after completing a fishing event and before the next fishing event starts. If fishing has been completed for the day you must complete this section before those people who were fishing disembark from the vessel or (on a multi-day charter) before the vessel anchors or moors for the night.
- For the species and area combinations for which catch reporting is required, the following information needs to be included in the return: the species code, the total number of fish of that species caught, and the total number of fish of that species retained. The estimated weights are also required for individual southern bluefin tuna and Pacific bluefin tuna only.

Section 5

5. Sign and date each page.

I declare that the information I have given on this return is correct and complete, and that I have read and understood the explanatory notes supplied with this return.

Name of guide/skipper (e.g. J.SMITH)

Signature

Date signed

•		/ /
---	--	-----

Name of guide/skipper

- The person overseeing the fishing activity.
- For a nil return this may be the charter vessel guide/skipper, the charter vessel operator, or a person approved by the charter vessel operator in the operator's listing information.

Signature

- The signature of the named guide/skipper.

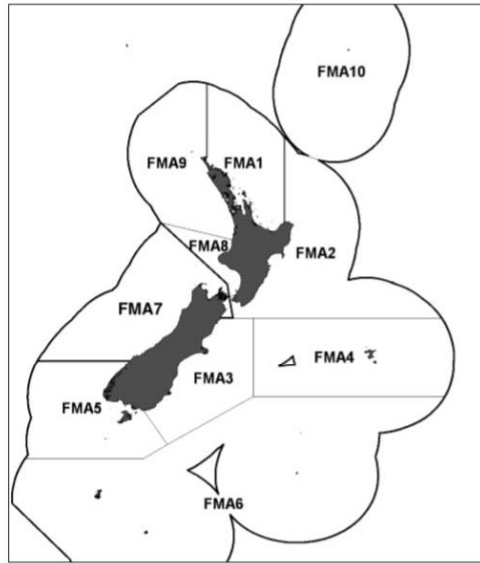
Date signed

- The date the return was signed in dd/mm/yy format.

Additional notes on completing Section 5:

- The declaration must be completed and signed once each page is completed and, on the last page, before fishers disembark from the vessel at the end of a trip at the latest.
- Each page of the return must be signed and dated by a person who is onboard when the fishing covered by the return takes place. The details of the person completing the declaration must be included in the operator's listing information as either the operator or as a guide or skipper.

Charter Vessel Catch Reporting Requirements



Common name	Species code	Fisheries Management Areas
Bass	BAS	All
Blue Cod	BCO	2,3,4,5,6,7,8
Bluenose	BNS	All
Rock Lobster	CRA	All
Hapuku / Groper	HAP	All
Kingfish	KIN	All
Southern Bluefin Tuna	STN	All
Pacific Bluefin Tuna	TOR	All

Effective October 2012

Ministry for Primary Industries
Ministère des Pêches et des Aquacultures

Amateur Fishing Charter Vessel Activity Catch Return ACV

Page of

1. Complete one return (using as many pages as required) for each fishing trip. For multi-day trips each day must start on a new page.

Date of fishing (dd/mm/yy)	MNZ/MSA number of vessel	Name of vessel	MPI operator number	Port of departure	Nil return?
/ /					Yes <input type="radio"/> No <input type="radio"/>

3. Activity Reporting. Complete a new fishing event column each time the fishing location, fishing method or target species changes.

	New fishing event	New fishing event	New fishing event
Target species			
Fishing method			
People actively fishing			
Latitude: (degrees minutes)	° ' S	° ' S	° ' S
Longitude: (degrees minutes E/W)	° ' E/W	° ' E/W	° ' E/W
Time spent fishing (hh:mm)	:	:	:

4. Catch Reporting. Complete one line for each species taken for which reporting is required (see Explanatory Notes for the Catch Reporting Species list).

	Species caught	Number caught	Number retained	Estimated weight (kg)		Species caught	Number caught	Number retained	Estimated weight (kg)		Species caught	Number caught	Number retained	Estimated weight (kg)
				.0kg					.0kg					.0kg
				.0kg					.0kg					.0kg
				.0kg					.0kg					.0kg
				.0kg					.0kg					.0kg
				.0kg					.0kg					.0kg
				.0kg					.0kg					.0kg

5. Sign and date each page.

I declare that the information I have given on this return is correct and complete, and that I have read and understood the explanatory notes supplied with this return.

Name of guide/skipper (e.g. J.SMITH)	Signature	Date signed
<input style="width: 90%;" type="text"/>	<input style="width: 90%;" type="text"/>	<input style="width: 90%;" type="text"/>

APPENDIX 2: SUMMARY OF GROOMED TABLES AND FIELD DEFINITIONS

Return table

Return_key	A unique identifier that has been generated automatically for each return at the time of data entry. Can be used to link the Return table to the Fishing Event and Catch tables. Unmodified field.
Form_no	The identification number printed on each form. Unmodified field.
Vessel	Single spelling for each vessel name. Correct spelling assumed when the vessel name for a record also appears on a vessel registry list. When a matching vessel name does not appear on the registry list, the registered name is used instead if there is a corresponding match to the MSA number or operator number recorded for that record. Some initial hard wiring used to correct for obvious spelling errors. All vessel names formatted to lower case to improve the likelihood of a match.
MSA_no	Maritime Safety Number. Correct number assumed when the recorded MSA number also appears on a vessel registry list. When a matching MSA number does not appear on the registry list, the registered MSA number is used instead if there is a corresponding match to the vessel name or operator number for that record. Some initial hard wiring used to correct for mis-punched MSA numbers.
Operator_no	Assigned when a vessel is registered. Correct number assumed when the recorded Operator number also appears on a vessel registry list. When a matching operator number does not appear on the registry list, the registered operator number is used instead if there is a corresponding match to the vessel name or MSA number for that record. Some initial hard wiring used to correct for mis-punched operator numbers. Note that some operators own multiple registered vessels, so cross referencing of this field is done after the grooming of the vessel names and MSA numbers is complete.
Skipper	As recorded. Unmodified field.
Port_origin	As recorded. Unmodified field. The base port recorded for a vessel in the vessel registry may be more reliable for some records.
Event_date	As recorded. All records reformatted to yyyy-mm-dd format. Date set to null if recorded date occurs before 1 October 2010 or after the date on which the grooming code is run.
Month	Derived from event date.
Year	Calendar year derived from event date.
Fishing year (October)	October to September fishing year identifier derived from event date.
Fishing year (April)	April to March fishing year identifier derived from event date.
Signing date	As recorded. Unmodified field.
Null return	Y or N based on whether a corresponding fishing event record appears in the Fishing Event table. Far more reliable than “Null return?” check box entries recorded by vessel skippers, who often tick both yes and no, nor neither.

Fishing Event table

Return_key	A unique identifier that has been generated automatically for each return at the time of data entry. Can be used to link the Fishing Event table to the Return and Catch tables. Unmodified field.
Fishing_event_key	A unique identifier that has been generated automatically for each fishing event at the time of data entry. Can be used to link the Fishing Event table to the Catch table. Unmodified field.
Event_column_no	A unique identifier indicating the column on which an event was recorded on the form. Unmodified field.
Vessel	see <i>Return table</i> section.
MSA_no	see <i>Return table</i> section.
Event_date	see <i>Return table</i> section.
Month	see <i>Return table</i> section.
Year	see <i>Return table</i> section.
Fishing year (October)	see <i>Return table</i> section.
Fishing year (April)	see <i>Return table</i> section.
Latitude	All records reformatted into a decimalised degree format.
Longitude	All records reformatted into a decimalised degree format.
Statistical area	Derived field. Latitude and longitude used to assign fishing events to statistical reporting area polygons that have been buffered inshore, so that events with less precise reported positions can still be attributed to their nearest statistical reporting area.
FMA	Derived field. Latitude and longitude used to assign fishing events to Fisheries Management Area (FMA) polygons that have been buffered inshore, so that events with less precise reported positions can still be attributed to their nearest FMA. The FMA encompassing the registered base port for a vessel is used when the latitude and longitude of a fishing event reported for that vessel has not been recorded.
CRA QMA	Derived field. Latitude and longitude used to assign fishing events to rock lobster Quota Management Area (QMA) polygons that have been buffered inshore, so that events with less precise reported positions can still be attributed to their nearest rock lobster QMA. The rock lobster QMA encompassing the registered base port for a vessel is used when the latitude and longitude of a fishing event reported for that vessel has not been recorded.
Other area	Derived field. Latitude and longitude used to assign fishing events to areas specified by fisheries managers; these areas have also been buffered inshore. Polygons currently defined for Fiordland and Kaikoura. The area defined for this field that encompasses the registered base port for a vessel is used when the

latitude and longitude of a fishing event reported for that vessel has not been recorded.

Number of fishers	Numeric values expressed as integers. Median number of fishers calculated for each vessel and assigned to all events undertaken by a vessel when there is no record of the number of fishers involved in a fishing event. Maximum number of fishers capped to 35, following a review of data available for the period 1 October 2010 to 30 September 2018.
Fishing duration	Numeric values in hours. Capped at 24 hours, but very few records greater than this.
Target species	Standard three letter species acronyms used by Fisheries New Zealand. Lookup table used to translate long-form common names and misspelt codes into standard three letter acronyms. Most of these species codes appear in the AFCV-ACR logbook instructions given in Appendix 1, but other valid codes, which may have been used by charter boat skippers with commercial fishing experience, have been added to the lookup table.
Fishing method	Codes appear in the AFCV-ACR logbook instructions given in Appendix 1. Lookup table used to translate long-form common names and misspelt codes into a valid method code where possible.
Zero catch	Derived field. Y or N based on whether there was a corresponding catch record in the catch table for a Fishing_event_key.

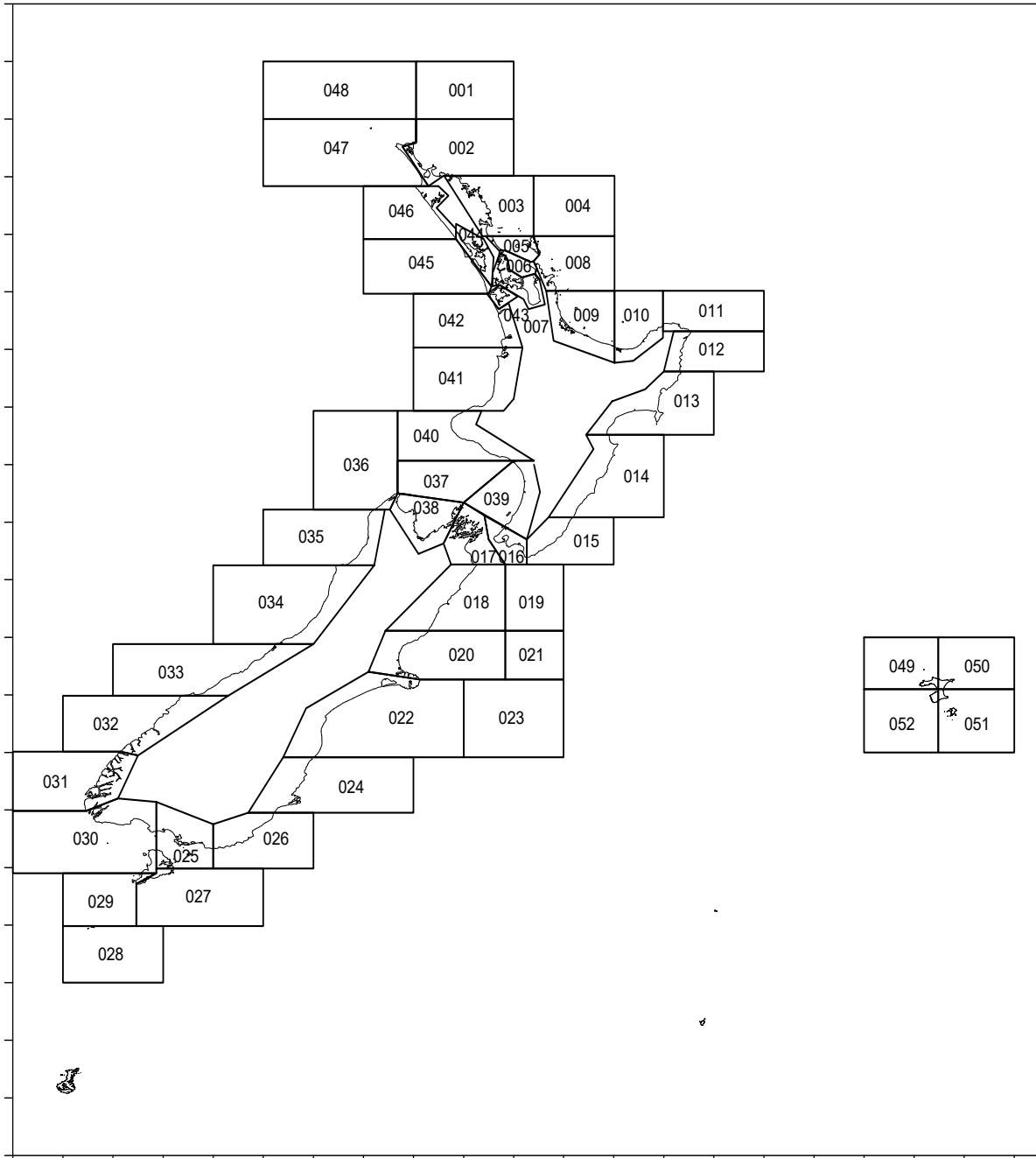
Catch table

Return_key	A unique identifier that has been generated automatically for each return at the time of data entry. Unmodified field. Can be used to link the Catch table to the Fishing Event and Return tables. Unmodified field.
Fishing_event_key	A unique identifier that has been generated automatically for each fishing event at the time of data entry. Unmodified field. Can be used to link the Catch table to the Fishing Event and Return tables. Unmodified field.
Catch_key	A unique identifier that has been generated automatically for each catch record at the time of data entry. Unmodified field.
Event_sequence_no	A unique identifier indicating the event sequence number for a specific trip. Unmodified field.
Vessel	see <i>Return table</i> section.
MSA_no	see <i>Return table</i> section.
Event_date	see <i>Return table</i> section.
Month	see <i>Return table</i> section.
Year	see <i>Return table</i> section.
Fishing year (October)	see <i>Return table</i> section.

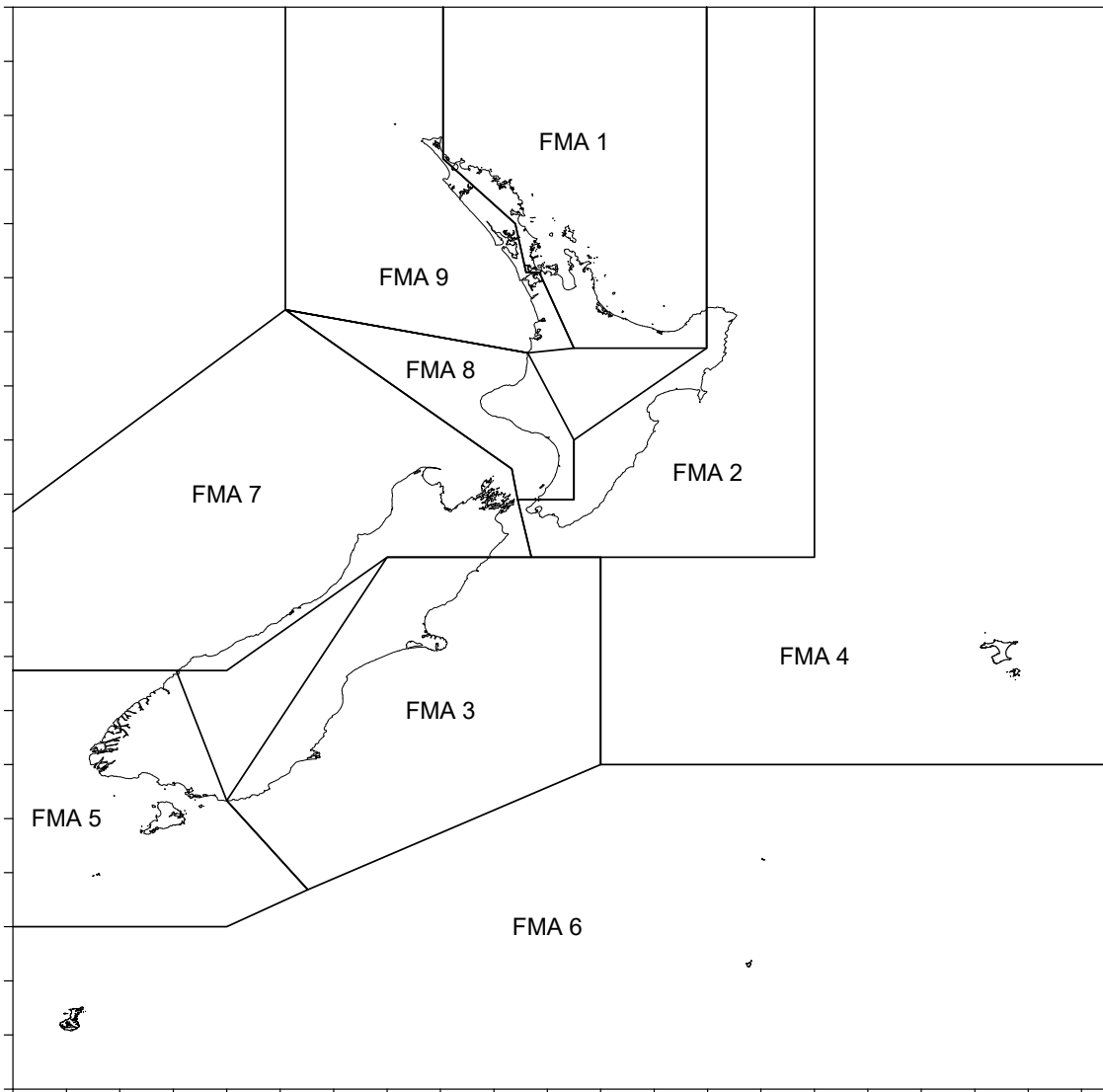
Fishing year (April)	see <i>Return table</i> section.
Latitude	see <i>Fishing Event table</i> section.
Longitude	see <i>Fishing Event table</i> section.
Statistical area	see <i>Fishing Event table</i> section.
FMA	see <i>Fishing Event table</i> section.
QMA	Lookup table used to identify the Quota Management Area (QMA) given the species code and the FMA in which the fishing event has been attributed to. For rock lobster, the QMA is taken from the Catch table CRA QMA field.
Other area	see <i>Fishing Event table</i> section.
Number of fishers	see <i>Fishing Event table</i> section.
Fishing duration	see <i>Fishing Event table</i> section.
Target species	see <i>Fishing Event table</i> section.
Fishing method	see <i>Fishing Event table</i> section.
Species caught	Standard three letter species acronyms used by Fisheries New Zealand. The lookup table used to translate common long-form names and misspelt species codes is the same as that used for the Target species field in the Fishing Event table. Species code changed from KIN to SUR when the reported Number retained of KIN was ≥ 10 from a fishing event were the reported fishing method code was DI, or when there is no recorded fishing method and the Number retained is ≥ 20 .
Number caught	Number of fish caught, expressed as an integer.
Number retained	Number of fish retained. Maximum catch capped to the number of fishers multiplied by the recreational daily bag limit in place for the QMA on the date on which the fishing event took place this is generated from a lookup table. Maximum catch limit not applied when a daily recreational bag limit has not been set for the relevant QMA.
Weight	Numeric values as entered.

APPENDIX 3: AREAS TO WHICH FISHING EVENTS ARE ASSIGNED

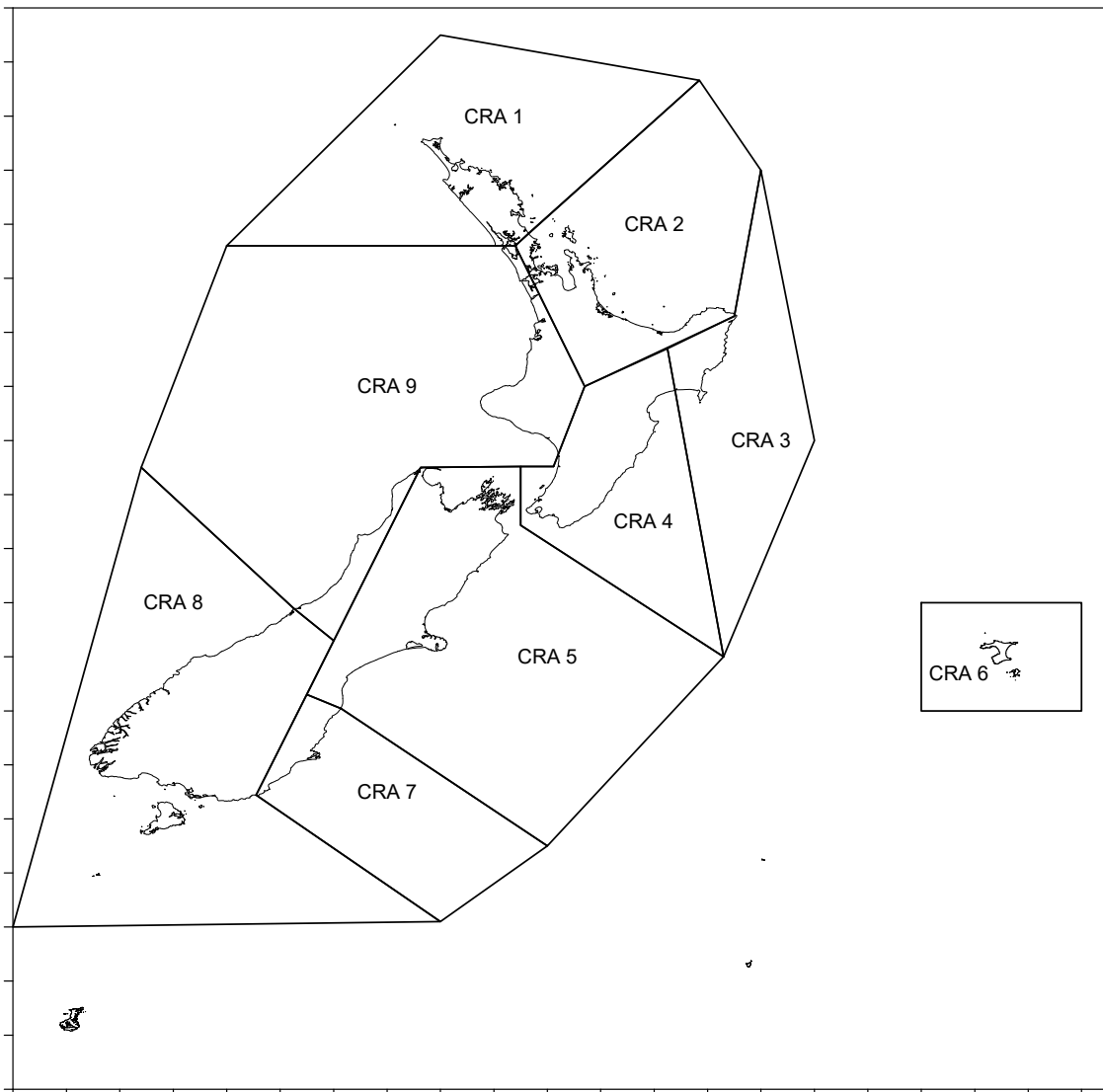
Definitions for inshore General Statistical Areas, showing inshore buffer.



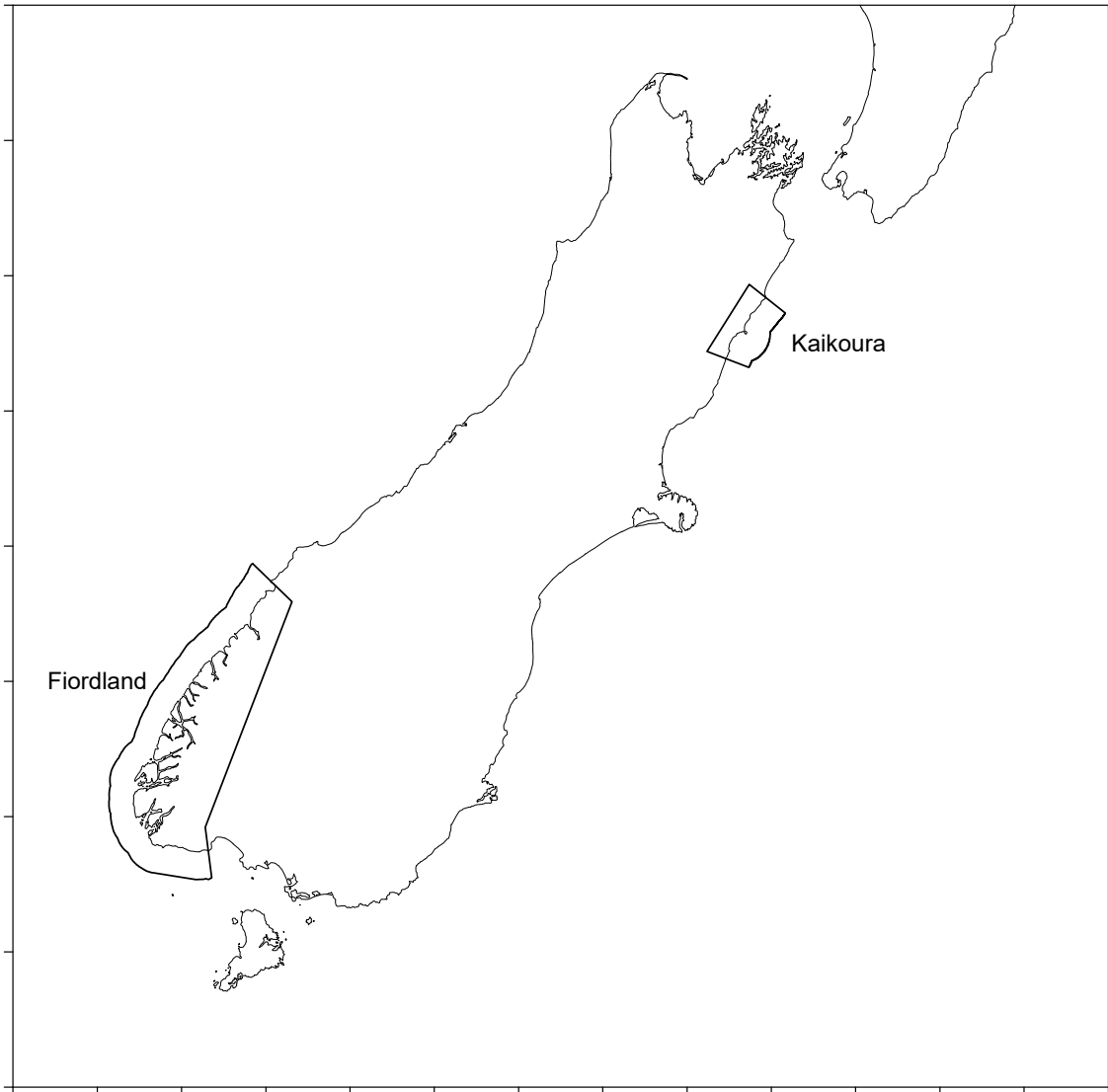
Definitions for Fishery Management Areas (FMAs), showing inshore buffer.



Definitions for rock lobster Quota Management Areas (CRA QMAs), showing inshore buffer.



Definitions for other areas requested by Fisheries New Zealand fisheries managers.



APPENDIX 4: CHARTER VESSEL OPERATOR SURVEY QUESTIONS

NZ Charter Reporting Survey

How to improve the Amateur Fishing Charter Vessel reporting programme

Marine recreational charter operators have been reporting charter trip information for eight years. NIWA and Blue Water Marine Research have a project to review all the data and provide useful summaries.

We are also interested in how the reporting programme could be improved so we are asking charter operators for their views. Your assistance is appreciated. This is a chance for you to have your say.

Click on the box to select an option or write in your answers.

All answers provided to Fisheries New Zealand will be anonymous, so it is helpful to know a bit about your charter business.

1. How many years have you operated a charter business?

2. What region or port do you mainly operate from?

3. What type of charter trips do you mainly do? You can tick more than one box if appropriate.

- Line fishing
- Game fishing
- Fly fishing
- SCUBA diving
- Free diving
- Other (please specify)

4. Are the instructions given in the logbook clear and adequate?

- Yes
- No

5. If you needed further clarification on how to fill out your returns, were you able to get it?

- Yes
- No

6. Is the reporting system easy to use?

- Yes
- Sometimes
- No
- Other (please specify)

The following questions are about the current reporting system

7. When you change your fishing location by more than more than 6 nautical miles or the fishing methods used or species targeted changes, do you record this in a new fishing event column?

- Yes
- Sometimes
- No

8. If you record a weight for a species (other than for bluefin tuna) what do you write down?

- Weight of retained fish for that species
- All catch retained and released for that species
- It depends on the situation

9. When do you fill out your return form? You can tick more than one box if appropriate.

- When the fishing event is complete
- Just before you dock
- At the end of the day
- At the end of the week or later

10. When was the last time that you were visited by a fisheries officer?

The following questions are about changes that could be made to the reporting system.

11. Do you think it would be feasible for all charter operators to report the number of fish caught (including released fish) and the number retained, for other species which you are not currently required to record, such as Snapper and Tarakihi? You can tick more than one box if appropriate.

- Report the number of Snapper and Tarakihi retained.
- Report the total number of Snapper and Tarakihi caught.
- Report catch of other species.

Which other species or comments

12. Would you agree to estimating the total weight of the retained catch for each species you report?

- Yes
- Sometimes
- No

13. You are currently required to report individual fish weights for Pacific and southern bluefin tuna. Would you agree to provide individual fish weights for retained fish of these species. You can tick more than one box if appropriate.

- Hapuku?
- Bass?
- Kingfish?
- Bluenose?
- No

14. With your charter boat operation, would electronic reporting at sea be feasible?

- Yes
- Sometimes
- No

15. Have you any comments that you would like to add about the charter vessel reporting programme?

Thanks for completing the survey.

We may want to follow up with a quick phone call. Please provide your name and phone number below, as we have not been given contact details by Fisheries New Zealand.

Name:

Phone number:

THANK YOU

[Typical time spent 9 minutes]